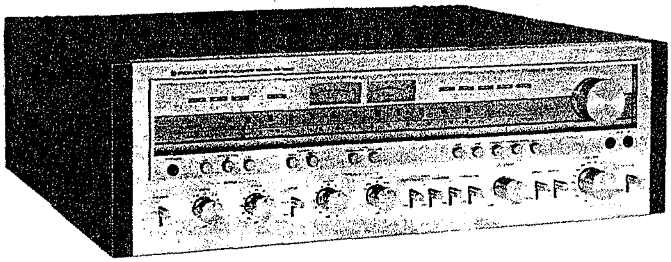
AM/FM STEREO RECEIVER

SX-1250

[illegible]



PIONEER®

MODEL SX-1250 COMES IN THREE VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KCU	120V only	CSA (Canada) and UL (U.S.A) approved with de-emphasis selector switch (25μs/75μs)
HG	220V and 240V (Switchable)	SEMKO (Sweden), NEMKO (Norway), DEMKO (Denmark) and EI (Finland) approved
S	110V, 120V, 220V and 240V (Switchable)	General export model with de-emphasis selector switch (25μs/50μs/75μs)

When repairing S or HG type, please see the manual on page 101.

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1. SPECIFICATIONS

Semiconductors

FETs	5
ICs	6
Transistors	82
Diodes	60

Power Amplifier Section

Continuous Power Output from 20 Hertz to 20,000 Hertz (Both channels driven)	160 watts per channel (8 ohms)
	200 watts per channel (4 ohms)
Total Harmonic Distortion (20 Hertz to 20,000 Hertz, from AUX)	
Continuous Rated Power Output	No more than 0.1%
80 watts per channel power output, 8 ohms	No more than 0.05%
1 watt per channel power output, 8 ohms	No more than 0.07%
Intermodulation Distortion (50 Hertz : 7,000 Hertz = 4 : 1, from AUX)	
Continuous Rated Power Output	No more than 0.1%
80 watts per channel power output, 8 ohms	No more than 0.05%
1 watt per channel power output, 8 ohms	No more than 0.07%
Frequency Response	5Hz to 100,000Hz $^{+0}_{-1}$dB
Input Sensitivity/Impedance	
POWER AMP IN	1 V/50k ohms
Output	
Speaker	A, B, C, A+B, B+C, A+C
Headphone	Low Impedance
Damping Factor (20Hz to 20,000Hz, 8 ohms)	30
Hum and Noise (IHF, short-circuited, A Network)	100dB

Preamplifier Section

Input Sensitivity/Impedance	
PHONO 1	2.5mV/50k ohms
PHONO 2	2.5mV/50k ohms
MIC	6.5mV/50k ohms
AUX	150mV/50k ohms
TAPE PLAY 1	150mV/50k ohms
TAPE PLAY 2	150mV/50k ohms
TAPE PLAY 2 (DIN connector)	150mV/50k ohms
PHONO Overload Level (T.H.D. 0.1%)	
PHONO 1	500mV (1kHz)
PHONO 2	500mV (1kHz)
Output Level/Impedance	
TAPE REC 1	150mV
TAPE REC 2	150mV
TAPE REC 2 (DIN connector)	30mV/80k ohms
PRE OUT	1V/1k ohms
Total Harmonic Distortion (20Hz ot 20,000Hz, 1V output)	No more than 0.02%
Frequency Response	
PHONO (RIAA equalization)	30Hz to 15,000Hz ±0.2dB
AUX, TAPE PLAY	10Hz to 50,000Hz $^{+0}_{-1}$dB

Tone Control		
BASS	MAIN	±10dB (100Hz)
	SUB	± 5dB (50Hz)
TREBLE	MAIN	±10dB (10kHz)
	SUB	± 5dB (20kHz)

Filter	
LOW	30Hz (12dB/oct.)
HIGH	8kHz (12dB/oct.)
Loudness Contour (Volume control set at −40dB position)	+6dB (100Hz), +3dB (10kHz)
Hum and Noise (IHF, short-circuited, A Network, rated power)	
PHONO	75dB
AUX, TAPE PLAY	90dB
Muting	−20dB

FM Section

Usable Sensitivity		MONO	8.7dBf (3.0μV/300Ω)
		STEREO	14.5dBf (5.8μV/300Ω)
Usable Sensitivity (IHF '58)			1.5μV
50dB Quieting Sensitivity		MONO	11.5dBf (4.1μV/300Ω)
		STEREO	36.0dBf (69μV/300Ω)
Signal-to-Noise Ratio	at 65dBf	MONO	80dB
		STEREO	74dB
Distortion at 65dBf	100Hz	MONO	0.1%
		STEREO	0.25%
	1kHz	MONO	0.1%
		STEREO	0.2%
	6kHz	MONO	0.3%
		STEREO	0.3%

Frequency Response	30Hz to 15,000Hz $^{+0.3}_{-1.0}$dB
Capture Ratio	1.0dB
Alternate Channel Selectivity	83dB
Spurious Response Ratio	110dB
Image Response Ratio	110dB
IF Response Ratio	120dB
AM Suppression Ratio	60dB
Muting Threshold	13dBf (4.9μV/300Ω)
Stereo Separation	50dB (1kHz), 35dB (30Hz ~ 15kHz)
Subcarrier Product Ratio	74dB
SCA Rejection Ratio	74dB
Antenna Input	300 ohms balanced 75 ohms unbalanced

AM Section

Sensitivity (IHF, Ferrite antenna)	300μV/m
(IHF, Ext. antenna)	15μV
Selectivity	40dB
Signal-to-Noise Ratio	55dB
Image Response Ratio	65dB
IF Response Ratio	85dB
Antenna	Built-in Ferrite Loopstick Antenna

Miscellaneous

Power Requirements	120V 60Hz
Power Consumption	650W (UL, CSA) 1200W (max.)
Dimensions	556(W) x 186.5(H) x 464.5(D) mm 21-7/8(W) x 7-3/8(H) x 18-1/4(D) in
Weight Without Package	29.2kg (64 lb 4 oz)
With Package	33.2kg (73 lb 1 oz)

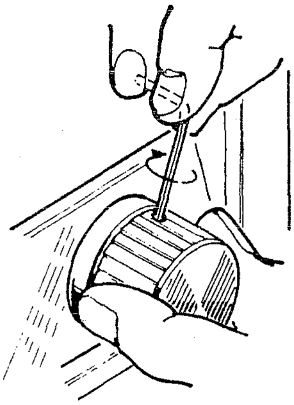
Furnished Parts

FM T-type Antenna	1
Operating Instructions	1
Hex. Wrench	1

NOTE:
Specifications and the design subject to possible modification without notice due to improvements.

HEX WRENCH

The accessory Hex. wrench is provided for removing the VOLUME and TUNING knobs, or for tightening its setscrew in the event it becomes loose.
If required, loosen the setscrew by inserting the wrench into the hole on the side of the knob and turning the wrench counterclockwise. Be particularly careful not to scratch the front panel when employing the wrench.



2. FRONT PANEL FACILITIES

FUNCTION SELECTOR BUTTONS

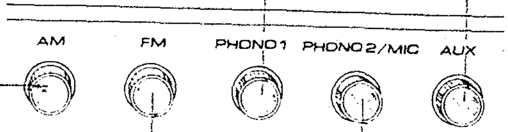
To select the program source, push each button as follows:

NOTE:
Only one FUNCTION button should be depressed at a time.

AM . . . . For AM broadcast reception.

PHONO 1 . . . . . To operate a turntable connected to the PHONO 1 input jacks.

AUX . . . . For listening to audio component (cartridge tape player, TV sound tuner, etc.) connected to the AUX input jacks.

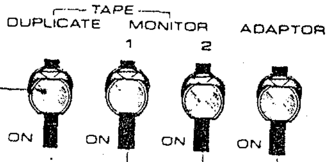


FM . . . . For FM stereo reception. Automatically receives monophonically during FM monophonic broadcasts. The STEREO indicator lights up when the broadcast is in stereo.

PHONO 2/MIC. As above for PHONO 2 jacks, or for reproduction through microphones connected to the MIC jack is on the front panel. Note, when the microphone is connected to the jack the turntable connected to the PHONO2 jacks cannot be used.

TAPE DUPLICATE SWITCH

Set this switch in the ON (down) position to duplicate or edit a recorded tape using two tape decks.



TAPE MONITOR (1, 2) SWITCHES

Set these switch in the ON (down) position as follow:

1 . . . . With a tape deck connected to the TAPE 1 jacks (REC and PLAY), either playback or monitoring of a recording in progress are possible.

2 . . . . Same as in 1 above, with a tape deck connected to the TAPE 2 jacks (REC and PLAY).

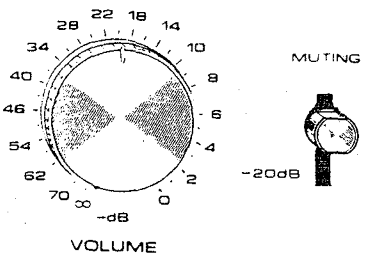
For normal use, leave in the OFF (up) positions.

ADAPTOR SWITCH

When employing adaptor components, such as a graphic equalizer adaptor, RG processor, or Dolby NR adaptor, depress this ADAPTOR switch to ON.

VOLUME CONTROL AND AUDIO MUTING SWITCH

The extremely high power output of the SX-1250 can be finely controlled by combining the calibrated VOLUME control and the AUDIO MUTING switch.
The AUDIO MUTING switch can also be used to briefly lower the volume when changing records or tapes.



SPEAKER BUTTONS

Three sets of speaker terminals, A, B, and C, are provided on the rear panel, and the required speaker systems can be selected by depressing the SPEAKERS buttons as follows:

A .... Speaker systems A operate
B .... Speaker systems B operate
C .... Speaker systems C operate

NOTES:

1. *When any two buttons (A+B, B+C, C+A) are depressed simultaneously, the corresponding pairs of speaker systems will come into operation. However, it is not possible to operate all three speaker systems at the same time, even though all the buttons are depressed.*
2. *For private listening through headphones, return all the SPEAKERS buttons to the OFF (undepressed) position.*

FM TUNING METER

With the SIGNAL meter needle deflected to the right, make fine adjustment by centering the FM TUNING meter needle (indicating optimum reception).

SIGNAL METER

For AM and FM station tunings.

AM tuning:	Tune for maximum deflection of the SIGNAL meter needle to the right.
FM tuning:	Both the SIGNAL and FM TUNING meters work together. The optimum point of the SIGNAL meter needle is the same as in AM tuning. Then use the FM TUNING meters.

SPEAKER SYSTEM INDICATOR

FM STEREO INDICATOR

TUNING KNOB

Select the station and tune for optimum reception by observing the SIGNAL meter for AM stations, and both SIGNAL and TUNING meters for FM stations.

FM MUTING BUTTON

Leave this button undepressed (in the ON position) to suppress unpleasant interstation noise while tuning between FM stations. Low-strength signals may also be suppressed by this function, so to pick up a weak station depress this button to the OFF position.

PROGRAM SOURCE INDICATOR

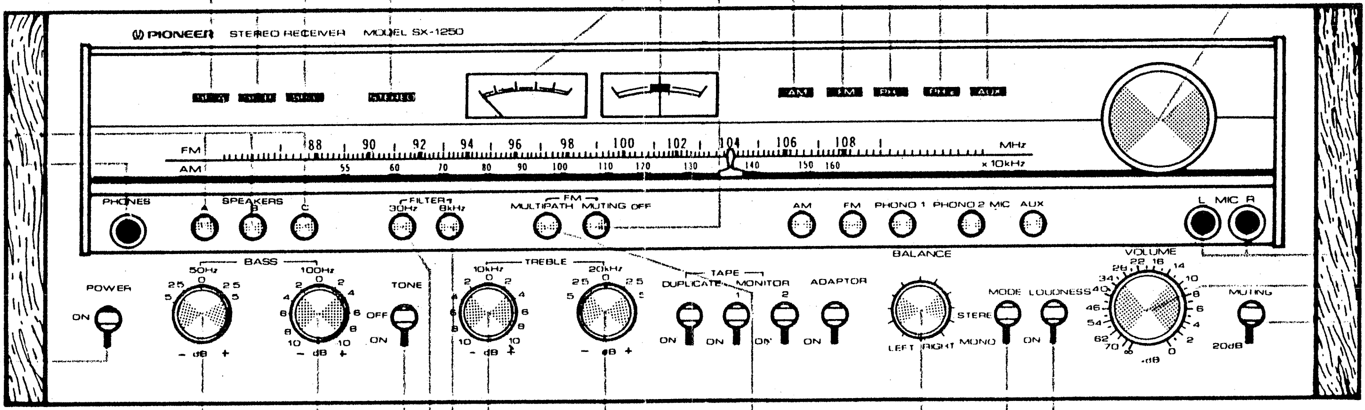
MIC JACKS (L and R)

For connect each channel jacks the left and right channel microphones.

NOTE:
Use the high impedance (above 20kΩ) with 6mm diam. phone plugs.

VOLUME CONTROL

Adjusts output level to speakers and headphones.
Scale is graduated in dB, and when used in conjunction with the MUTING switch, finer and wider range attenuation can be performed. See additional description on page 6.



PHONES JACK

Accepts stereo headphones.

WARNING:
Do not plug a microphone into the PHONES jack as may damage the microphone.

POWER SWITCH

After turning this switch ON there is a delay of some 6 to 8 seconds, during which time the protection circuit operates to eliminate unpleasant noise.

TWIN BASS CONTROLS

Adjust low frequency tone.

100Hz:	Adjusts frequency band below 400Hz. Control effectiveness at 100Hz is ±10dB.
50Hz:	Provides additional control for the frequency band below 200Hz. Control effectiveness at 50Hz is ±5dB.

TONE SWITCH

In the OFF (up) position, this switch causes the amplifier section to operate with a flat frequency response regardless of the tone control setting.

LOW CUT (30Hz) FILTER BUTTON

When low-pitched rumble (from turntable motor or other source) is obstrusive depress this button to provide 12dB/octave, attenuation at frequencies below 30Hz. If no interference is experienced, release this button.

HIGH CUT (8kHz) FILTER BUTTON

When high frequency scratch noise (from worn records or other source) is unpleasant, depress this button to provide 12dB/octave attenuation at frequencies above 8kHz. If there is no interference, release this button.

FM MULTIPATH BUTTON

When selecting the best position for the FM antenna, depress this button so that multipath noise is heard from the speaker systems. To listen to FM broadcasts, release this button.

TWIN TREBLE CONTROLS

Adjusts high frequency tone.

10kHz:	Adjusts frequency band above 2.5kHz. Control effectiveness at 10kHz is ±10dB.
20kHz:	Provides additional control for the frequency band above 5kHz. Control effectiveness at 20kHz is ±5dB.

AUDIO MUTING SWITCH – 20dB

Depress this switch to attenuate the audio output by 20dB. This convenient feature saves having to disturb the VOLUME control, for example when answering the telephone.

LOUDNESS SWITCH

Depress this switch when listening at low volume. The frequency response of the human ear varies according to the listening volume, and the depressed position compensates for hearing response by emphasizing the bass and treble.

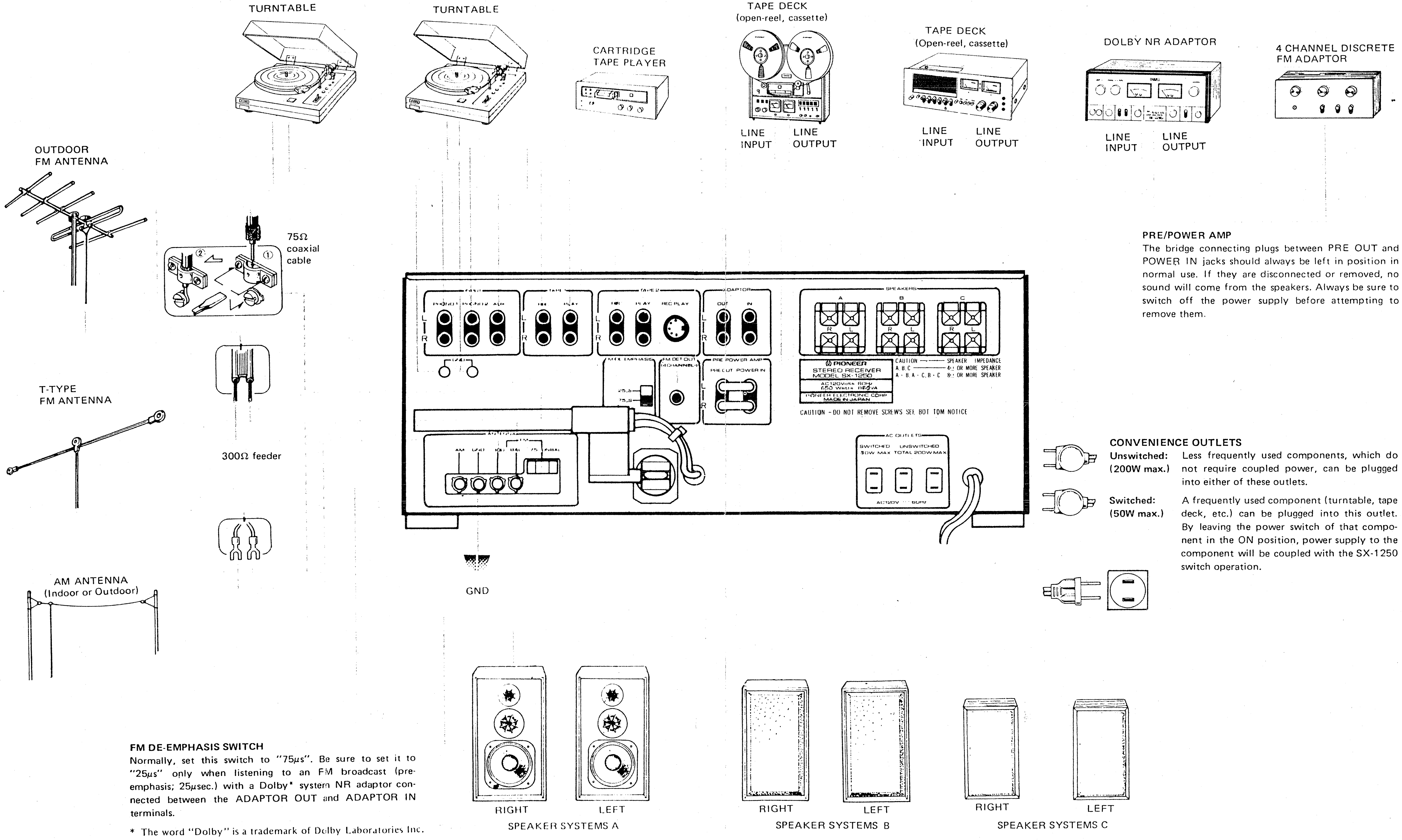
MODE SWITCH

For stereo playback, leave this switch undepressed (or depress to release, if already depressed). When depressed for MONO playback, left and right channel stereo signals will be mixed to produce monophonic sound from both speaker systems.

BALANCE CONTROL

Adjusts the balance between the sound volume from the left and right speaker systems or headphones.

3. CONNECTION DIAGRAM


TURNTABLE
TURNTABLE
CARTRIDGE TAPE PLAYER
TAPE DECK (open-reel, cassette)
LINE INPUT
LINE OUTPUT
TAPE DECK (Open-reel, cassette)
LINE INPUT
LINE OUTPUT
DOLBY NR ADAPTOR
LINE INPUT
LINE OUTPUT
4 CHANNEL DISCRETE FM ADAPTOR
OUTDOOR FM ANTENNA
75Ω coaxial cable
①
②
T-TYPE FM ANTENNA
300Ω feeder
AM ANTENNA (Indoor or Outdoor)
GND
TAPE 2
REC
PLAY
REC PLAY
ADAPTOR
OUT
IN
L
R
SPEAKERS
A
B
C
R
L
PIONEER
STEREO RECEIVER MODEL SX-1250
AC120Volts 60Hz 650 Watts 860VA
PIONEER ELECTRONIC CORP MADE IN JAPAN
CAUTION — SPEAKER IMPEDANCE
A, B, C — 4Ω OR MORE SPEAKER
A + B, A + C, B + C 8Ω OR MORE SPEAKER
CAUTION - DO NOT REMOVE SCREWS SEE BOTTOM NOTICE
FM DE-EMPHASIS
25µs
75µs
FM DET OUT (4CHANNEL)
PRE POWER AMP
PRE OUT POWER IN
ANTENNA
FM
AM
GND
300
BAL
75
UNBAL
AC OUTLETS
SWITCHED 50W MAX
UNSWITCHED TOTAL 200W MAX
AC120V 60Hz
RIGHT
LEFT
SPEAKER SYSTEMS A
RIGHT
LEFT
SPEAKER SYSTEMS B
RIGHT
LEFT
SPEAKER SYSTEMS C

PRE/POWER AMP

The bridge connecting plugs between PRE OUT and POWER IN jacks should always be left in position in normal use. If they are disconnected or removed, no sound will come from the speakers. Always be sure to switch off the power supply before attempting to remove them.

CONVENIENCE OUTLETS

Unswitched: (200W max.)	Less frequently used components, which do not require coupled power, can be plugged into either of these outlets.
Switched: (50W max.)	A frequently used component (turntable, tape deck, etc.) can be plugged into this outlet. By leaving the power switch of that component in the ON position, power supply to the component will be coupled with the SX-1250 switch operation.

FM DE-EMPHASIS SWITCH

Normally, set this switch to "75µs". Be sure to set it to "25µs" only when listening to an FM broadcast (pre-emphasis; 25µsec.) with a Dolby* system NR adaptor connected between the ADAPTOR OUT and ADAPTOR IN terminals.

* The word "Dolby" is a trademark of Dolby Laboratories Inc.

4. CIRCUIT DESCRIPTIONS

4.1 TUNER SECTION

FM Front End

The FM front end is composed of a tuning circuit employing a 5-gang variable capacitor, a 2-stage RF amplifier and mixer employing dual gate MOS FETs, and a local oscillator with buffer. An equivalent of a cascode amplifier is produced by AC grounding gate-2 of the dual gate MOS FET, allowing stable RF amplification at high gain.

The output signal of the RF amplifier is applied to gate-1 of the mixer stage MOS FET, while the local oscillator output signal is applied to gate-2. This technique minimizes input power from the local oscillator, resulting in low mutual interference even if the received signal input level is high.

A variation of a Clapp circuit forms the local oscillator. Inclusion of a buffer amplifier between local oscillator and mixer reduces local oscillator load, eliminating distortion of the oscillation waveform. Drawing effect of the local oscillator is also eliminated.

FM IF Section

Four integrated circuits (ICs) and four dual element ceramic filters compose this section. HA1201 (diagram on page 56) is a differential amplifier with a constant current source and functions as a current-limiting limiter. HA1137 (diagram on page 55) contains IF limiter amplifier, quadrature detector, meter drive and muting circuits. The detector circuit contained within this IC is not used in the SX-1250 however, and instead the IF signal is taken from the stage prior to the detector and applied to TA7061AP. This latter IC is a 3-stage differential amplifier (diagram on page 56) and its output goes to the ratio detector for FM detection.

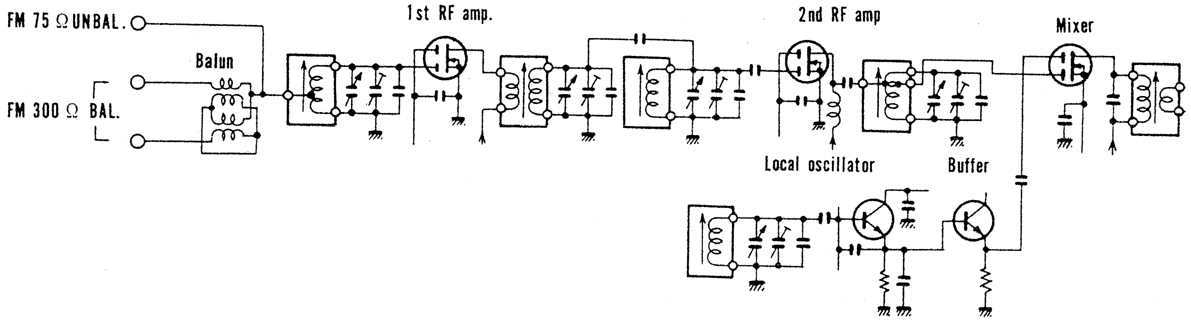

FM 75 Ω UNBAL.
FM 300 Ω BAL.
Balun
1st RF amp.
2nd RF amp
Mixer
Local oscillator
Buffer

Fig. 1. Circuitry of FM front end

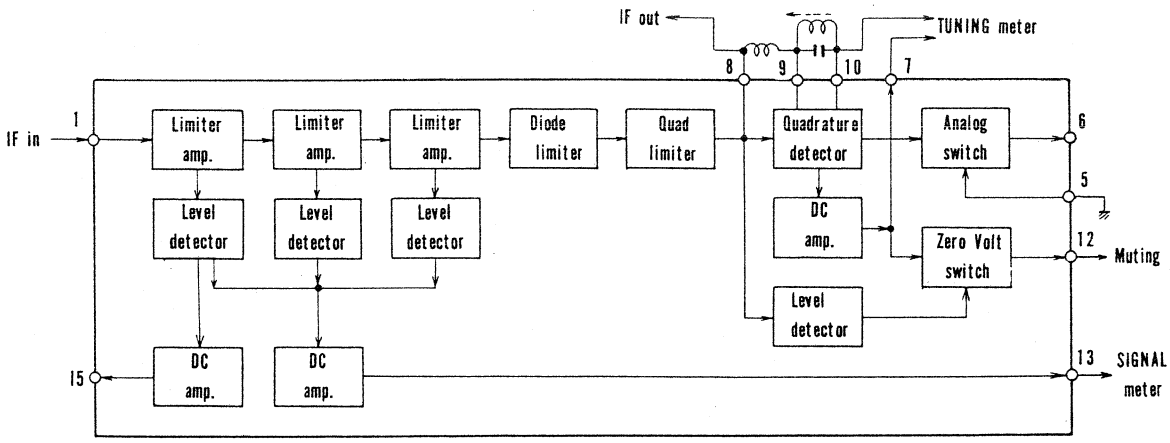

IF out
TUNING meter
IF in
1
8
9
10
7
6
5
12
Muting
13
SIGNAL meter
15
Limiter amp.
Limiter amp.
Limiter amp.
Diode limiter
Quad limiter
Quadrature detector
Analog switch
Level detector
Level detector
Level detector
DC amp.
Zero Volt switch
Level detector
DC amp.
DC amp.

Fig. 2. Block diagram for HA1137

Multiplex Decoder

The multiplex decoder contains three sections and employs an IC (HA1196) with a block diagram as shown in Fig. 3 (see page 55 for circuit).

1. Switching Signal Generator

A PLL (phase locked loop) system is employed. 76kHz is generated by the VCO (voltage controlled oscillator: an oscillator in which frequency is controlled by a voltage) and converted into 38kHz by a frequency divider, then divided again to become 19kHz. This signal and the stereo pilot component (19kHz) of the detected signal are applied to a phase comparator where the difference between them is converted into a voltage. By feedback this voltage is applied to the VCO. And the oscillator signal is locked to the pilot signal. This loop is termed PLL and a 38kHz switching signal synchronized to the pilot signal is obtained and employed as a switching signal.

2. Automatic stereo detector

With the PLL locked to the pilot signal, the pilot signal and a 19kHz signal of the same phase are produced. A voltage is then obtained at the phase comparator that is proportional to the pilot signal amplitude. As it increases, the lamp lights and the switch becomes on. The switching signal is applied to the demodulator.

However, if the FM muting signal is also applied to pin 12, the detector circuit becomes disabled (grounded). Therefore a switching signal to the demodulator is not supplied and mono reproduction is obtained.

3. Demodulator

Two differential amplifiers are employed in a switching circuit (Fig. 4). The composite signal is applied to the base of Q3. Q1 and Q2 are alternately switched ON and OFF by the switching signal. The composite signal amplified at Q3 is demodulated by the switching of Q1 and Q2. Q6 and Q3 are loosely coupled at their emitters by R1, R2 and R3. Q6 is driven in opposite phase to Q3 and its low level composite signal output is demodulated by switching of Q4 and Q5. The demodulated signals in opposite phase are combined at the collectors of Q1 and Q2, cancelling crosstalk. Adequate current flow is required in Q3 and Q6 for low distortion. However, if the base bias voltage is raised, the voltage range available at the collector is reduced and clipping occurs (power supply voltage is limited by IC voltage requirement). For this reason, current from an external source is inserted at Q3 and Q6 collectors and become I1 and I2 in Fig. 4. The same amount of current is removed at the emitters of Q3 and Q6 to become I3 and I4 in Fig. 4. Q3 and Q6 therefore operate with adequate current and distortion in this stage is remarkably reduced. A feedback amplifier amplifies the demodulated signal to produce the IC outputs.

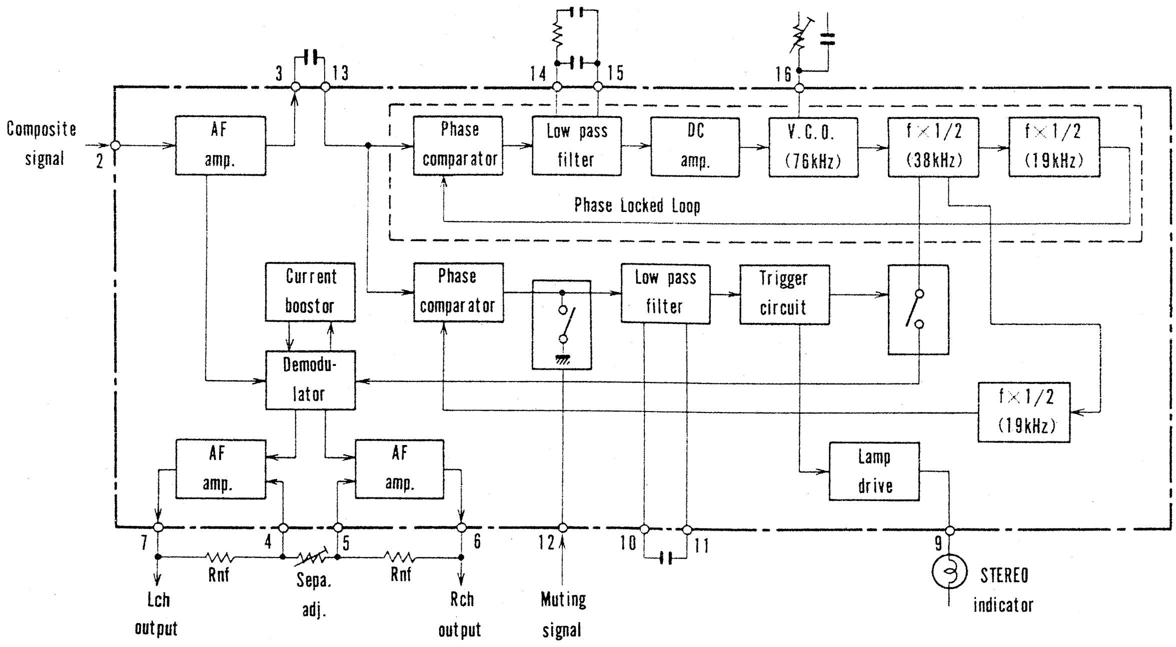

Composite signal
2
AF amp.
3
13
14
15
16
Phase comparator
Low pass filter
DC amp.
V.C.O. (76kHz)
f×1/2 (38kHz)
f×1/2 (19kHz)
Phase Locked Loop
Current boostor
Phase comparator
Low pass filter
Trigger circuit
Demodu-lator
f×1/2 (19kHz)
AF amp.
AF amp.
Lamp drive
7
4
5
6
12
10
11
9
Rnf
Sepa. adj.
Rnf
Lch output
Rch output
Muting signal
STEREO indicator

Fig. 3. Block diagram for HA1196

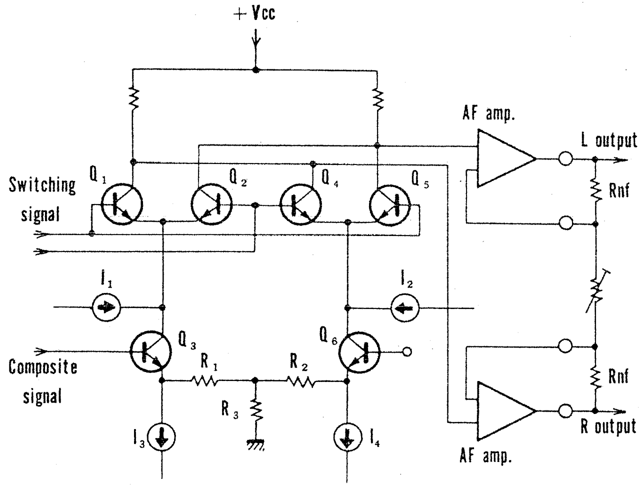

+Vcc
AF amp.
L output
Switching signal
Q_1
Q_2
Q_4
Q_5
Rnf
I_1
I_2
Q_3
Q_6
Composite signal
R_1
R_2
R_3
Rnf
R output
I_3
I_4
AF amp.

Fig. 4. Basic circuitry of demodulator

FM Muting Circuit (Fig. 5)

DC voltage emerges from pin 12 of IC (HA1137) in the event of more than ±70kHz detuning or low input level (less than 4.9μV antenna input conversion). This is employed for shorting the AF output circuit to perform muting by the reed relay.

Multipath Monitor Circuit

When multipath reflections exist in the received signal, the signal is converted into AM and PM (amplitude modulation and phase modulation) forms. Since the amplitude of the actual FM signal is fixed, by converting this AM component into a sound and listening to it, the existence (and amount) of multipath reflection can be determined. Short term level variations (audio frequency) are taken as a signal from HA1137 SIGNAL meter drive terminal (pin 13). By setting the FM MULTIPATH switch to ON during FM reception, this signal becomes connected to the audio amplifier and can be heard as a sound which indicates conditions of multipath reflection.

AM Tuner

The AM tuner employs a 3-gang variable capacitor and an IC (HA1138) with 1-stage of RF and 2-stage of IF amplification. Fig. 6 shows the HA1138 block diagram (see page 55 for circuit).

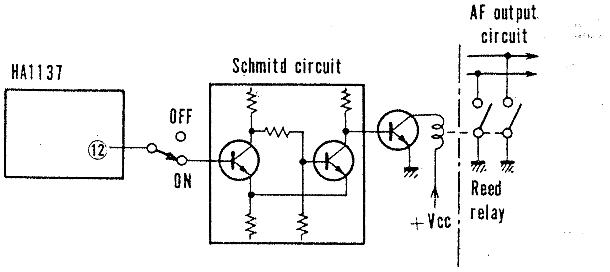

AF output circuit
HA1137
Schmitd circuit
OFF
⑫
ON
+Vcc
Reed relay

Fig. 5. Circuitry of FM muting

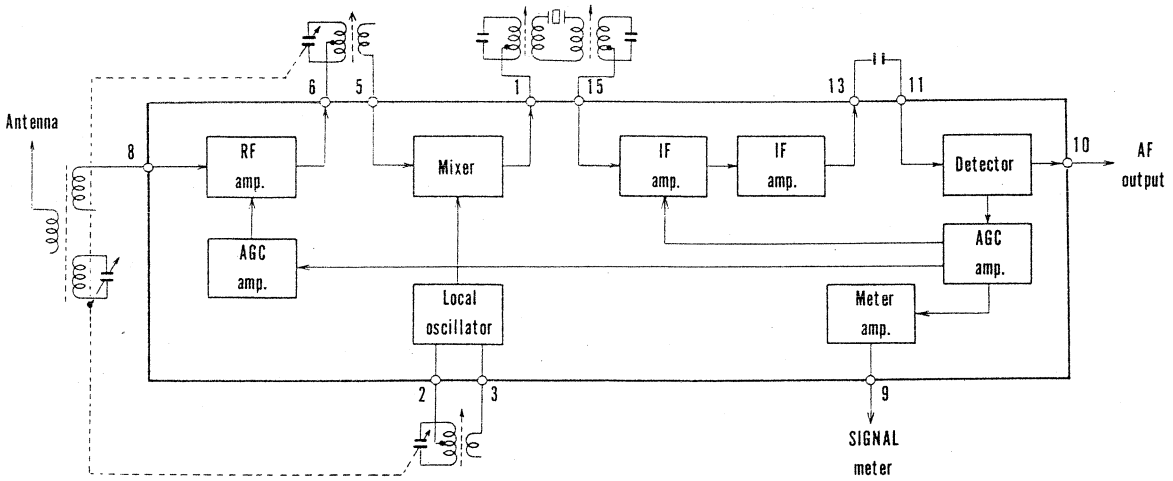

Antenna
6
5
1
15
13
11
8
RF amp.
Mixer
IF amp.
IF amp.
Detector
10
AF output
AGC amp.
AGC amp.
Local oscillator
Meter amp.
2
3
9
SIGNAL meter

Fig. 6. Block diagram for HA1138

4.2 AUDIO SECTION

Equalizer Amplifier

The equalizer amplifier is shown in Fig. 7. The first stage (Q1 & Q2) is a PNP transistor unbalanced differential amplifier. High voltage gain is provided in the following stage (Q3) by a bootstrap circuit (C1 & R1). The output stage (Q4 & Q5) is a complementary symmetrical SEPP circuit. The high voltage utility factor of the SEPP circuit provides a high maximum output voltage. Dynamic range of the equalizer amplifier is therefore wide and overload input level at 0.1% distortion is 500mV (rms at 1kHz).

Equalizer elements (C2, C3, R2, R3) are polystyrene film capacitors with tolerances within ±1% and metal film resistors with tolerances better than ±1%. These lead to a deviation with respect to the RIAA playback standard within ±0.2dB. Due to the balanced plus and minus power supply, the input and the output points become essentially 0V, reducing click noise during FUNCTION switch operation.

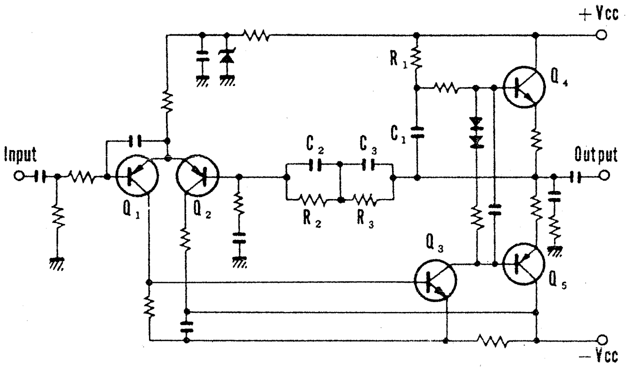

+Vcc
R1
Q4
C1
C2
C3
Input
Output
Q1
Q2
R2
R3
Q3
Q5
-Vcc

Fig. 7. Schematic diagram for Equalizer amplifier

Tape and Adaptor Circuits

With the DUPLICATE switch OFF, the program source selected by the function switches are obtained at the TAPE REC jacks (Fig. 8).

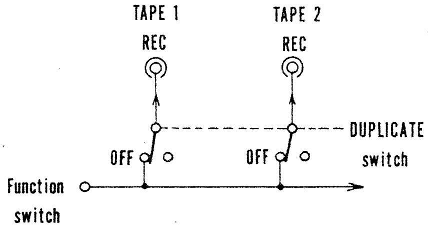

TAPE 1
REC
TAPE 2
REC
DUPLICATE
switch
OFF
OFF
Function
switch

Fig. 8. TAPE REC jacks

The TAPE MONITOR 1 switch selects between the program source selected by the function switch and the input at the TAPE 1 PLAY jacks (Fig. 9). The TAPE MONITOR 2 switch selects between the signal selected by the TAPE MONITOR 1 switch and the input at the TAPE 2 PLAY jacks (Fig. 9).

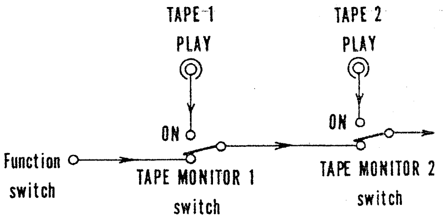

TAPE 1
PLAY
TAPE 2
PLAY
ON
ON
Function
switch
TAPE MONITOR 1
switch
TAPE MONITOR 2
switch

Fig. 9. Tape monitor circuit

When the DUPLICATE switch is set to ON, the TAPE 1 REC jacks are connected to the TAPE 2 PLAY jacks, and the TAPE 2 REC jacks to the TAPE 1 PLAY jacks (Fig. 10).

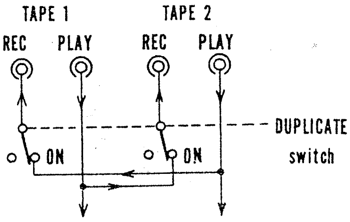

TAPE 1
REC
PLAY
TAPE 2
REC
PLAY
DUPLICATE
switch
ON
ON

Fig. 10. Tape duplicate circuit

The signal selected by the TAPE MONITOR 2 switch appears at the ADAPTOR OUT jacks (Fig. 11). The ADAPTOR switch selects between the signal selected by the TAPE MONITOR 2 switch and the input at the ADAPTOR IN jacks (Fig. 11).

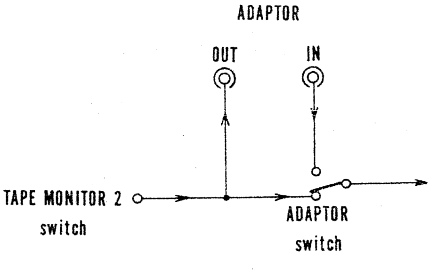

ADAPTOR
OUT
IN
TAPE MONITOR 2
switch
ADAPTOR
switch

Fig. 11. ADAPTOR jacks

MODE Switch

When the MODE switch is set to the MONO position, the left and right channels are shorted in the stage following the tape and adaptor circuits.

BALANCE Control

A no-loss HB type variable resistor at center position is employed. An SEPP circuit is inserted as a buffer in the following stage.

Muting Circuit

When the MUTING switch is set to the −20dB position, the signal is attenuated by 20dB.

Loudness Circuit

This circuit is operated ON or OFF by the LOUDNESS switch and is intended to compensate for audibility characteristics of the human ear at low volumes. The VOLUME control variable resistor is tapped. Connecting a CR network at this point enhances low and high frequencies at low volumes.

Tone Controls

Twin tone controls are employed with the SX-1250. These consist of ultra-low and ultra-high (sub) controls in addition to the conventional BASS and TREBLE (main) controls.

The signal is amplified to required level by a 2-stage FET and transistor direct coupled amplifier, after which a 2-stage NFB type tone control circuit is provided. The sub controls form the first stage and the main controls form the second stage of this circuit. With NFB type tone controls, C-B feedback is applied to a single transistor amplifier. Frequency response becomes variable by providing selectivity in the feedback circuit. The basic circuit of this stage is shown in Fig. 12.

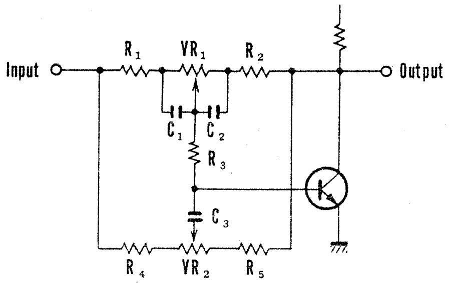


Fig. 12. Basic circuitry of NFB type tone control circuit

Midrange Operation

The C1 and C2 reactances are considerably smaller than VR1 at frequencies above midrange, effectively shorting VR1. At frequencies below midrange, C3 reactance becomes large and in effect, opens the circuit. Consequently, the circuit becomes equivalent to that shown in Fig. 13 with respect to the midrange. In this figure, the circuits parameters are not changed by any change in position of the VR1 and VR2 sliders. The NFB amount is therefore fixed and the circuit gain is also fixed without regard to VR1 and VR2 slider positions.

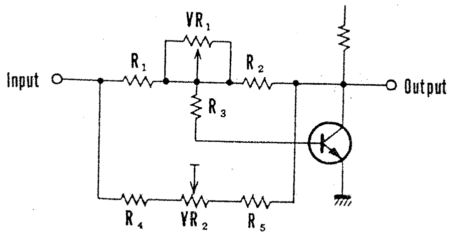


Fig. 13. Midrange operation of NFB type tone control circuit

Low Frequency Operation

The reactance of C1 and C2 increases at low frequency to form a circuit as shown in Fig. 14. This reactance increases in proportion to the frequency declines. Also, the NFB amount varies greatly according to VR1 slider position. The circuit gain at low frequencies can therefore be varied by VR1.

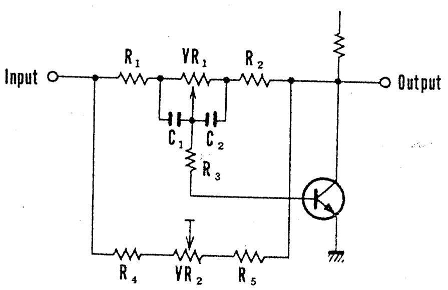


Fig. 14. Low frequency operation of NFB type tone control circuit

High Frequency Operation

The considerably smaller reactance of C1 and C2 at high frequency in comparison with VR1 effectively shorts VR1 to from an equivalent circuit such as that shown in Fig. 15. C3 reactance decreases in the same degree that the frequency increases and the NFB amount is now mainly controlled by the VR2 slider position. Consequently, the gain at high frequencies can be varied by VR2.

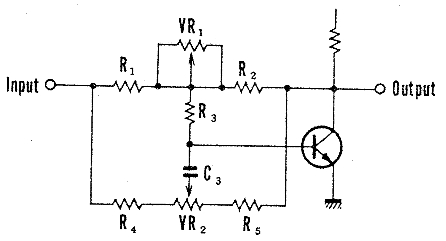


Fig. 15. High frequency operation of NFB type tone control circuit

Tone Defeat Circuit

By setting the TONE switch to OFF, the above described tone control circuit becomes bypassed.

Filter Circuits (Fig. 16)

These are NFB type active filters with −12dB/octave slopes. The circuit combines a 2-stage CR element and emitter follower. Normal function of the emitter follower is provided in the passband and by 100% NFB, gain becomes essentially "1". NFB is cancelled in the area of the cutoff frequency, composing a peak in the frequency response. This leads to improved and sharper CR filter response. In the actual circuit, CR elements for low and high filters both employ the same emitter follower and each can be selected ON-OFF.

Power Amplifier

Fig. 17 shows the power amplifier section. The input stage is composed of Q1 & Q2 differential amplifier, with the input signal applied to Q1. Q3 & Q4 differential amplifier comprise the second stage, with Q3 output composed at Q4 by Q5 & Q6 current mirror. Connecting collector and base of Q5 produces the equivalent of a diode. Q3 collector current produces a forward voltage between Q5 base and emitter, biasing Q6. R1 and R2 in this circuit are equal, while Q5 and Q6 are the same type transistors. Consequently, when voltages between bases and emitters of Q5 & Q6 are equal, current flows in these transistors also become equal. This results in equal current flows in Q3 and Q6. Mutually opposite phase signals drive Q3 and Q4, resulting in mutually opposite phase collector currents. Q4 and Q6 therefore operate as push-pull.

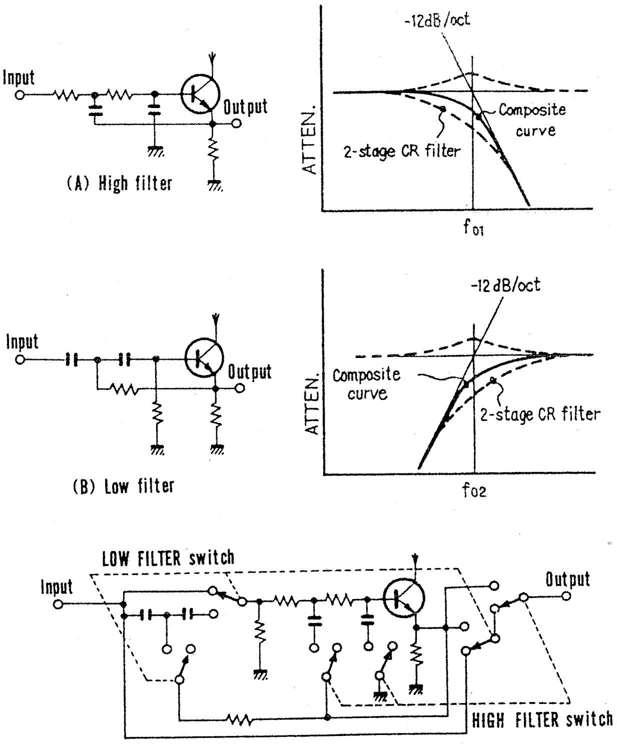

Input
Output
(A) High filter
-12dB/oct
Composite curve
2-stage CR filter
ATTEN.
f01
Input
Output
(B) Low filter
-12dB/oct
Composite curve
2-stage CR filter
ATTEN.
f02
LOW FILTER switch
Input
Output
HIGH FILTER switch

Fig. 16. Basic circuitry of filters

Power stage bias voltage is supplied by the voltage drop across D1, D2 and VR2. VR2 is a semi-fixed resistor for power stage bias adjustment, while D1 and D2 are Varistors for temperature compensation.

A 3-stage Darlington connection is employed in the power stage (Q7—Q14), with output transistors Q11—Q14 in a complementary symmetrical parallel

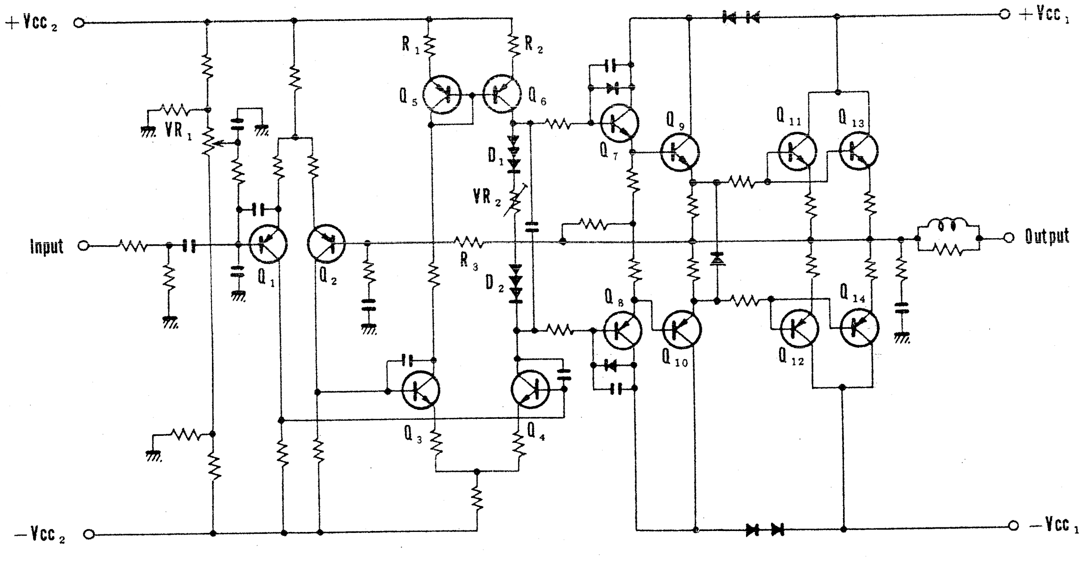

+Vcc2
R1
R2
Q5
Q6
+Vcc1
Q9
Q7
Q11
Q13
VR1
D1
VR2
Input
Q1
Q2
R3
D2
Output
Q8
Q14
Q10
Q12
Q3
Q4
−Vcc2
−Vcc1

Fig. 17. Schematic diagram for power amplifier

connection. The output center point is at 0V from the balanced plus and minus power supply, while 100% DC NFB is applied to Q2 through R3. Because of this, circuit DC gain becomes 0dB and DC voltage of the output center point is determined by Q1 base voltage. VR1 is a semi-fixed resistor for fine adjustment of the center point voltage to compensate for irregularities in circuit elements.

SPEAKERS Switches

The SX-1250 is provided with 3 sets of speaker terminals (A, B, C). Since the power amplifier can become overloaded if all three sets are used simultaneously, when all 3 SPEAKERS switches are set to ON, the circuit functions as if all switches were OFF and the indicator lamps extinguish.

4.3 PROTECTION CIRCUIT

This circuit protects the power transistors in case of overload, the speakers in case of power amplifier malfunction, and also performs a muting function when the power supply is turned ON or OFF. The protection circuit is composed of three sections (Fig. 18).

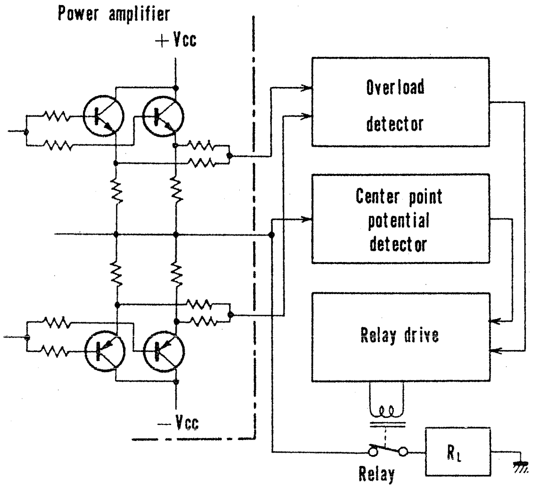


Fig. 18. Block diagram of protection circuit

1. Relay Driver Circuit (Fig. 19)

The relay which connects the output circuits is driven by this circuit. It also performs a muting function to prevent unpleasant noise during ON-OFF operation of the power supply as well as opening the output circuit on command from the detector circuits.

Muting Operation

When the power supply is turned ON, Q6 base is reverse biased through D6 and R19—R21, turning Q6 OFF. Q7 base potential rises as C4 charges through R22 & R23, and Q7 turns ON several seconds later. The collector current of Q7 then flows through the relay coil, operating the relay to turn on the power amplifier output circuit. The reverse bias of Q6 base from D6 & R19—R21 disappears when the power supply is set from ON to OFF. Q6 remains ON however, due to the residual power supply voltage. C4 very rapidly discharges, Q7 base potential drops and Q7 turns OFF. The relay releases and the power amplifier output circuit turns OFF.

Note:
Q5 is normally OFF due to base bias and does not participate in the muting operation.

Operation by Detector Circuit Command

Command from the detector circuits pass through one of D3, D4 or D5 and are applied in the form of a current flow. Q5 is normally reverse biased through R14, but when a large current flows through on of these diodes, Q5 base potential declines according to the voltage drop at R14. Q5 then becomes ON, Q6 base potential rises and Q6 becomes ON. C4 rapidly discharges and Q7 base potential drops, turning Q7 OFF. The relay releases and the power amplifier output circuit becomes cut off.

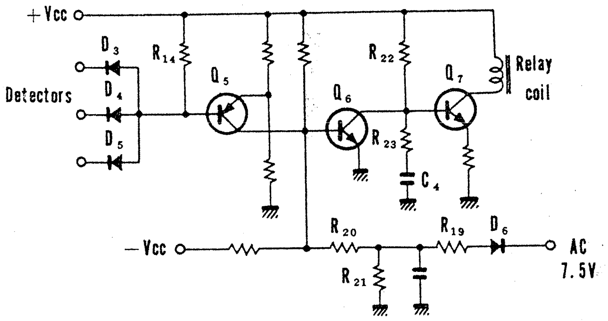


Fig. 19. Schematic diagram of relay driver circuit

2. Overload Detector Circuit

Shorting of the power amplifier load or a load impedance below the specified value causes a command to be sent to the relay drive circuit. This is illustrated in Fig. 20.

With the output stage in class B operation, when Qa is operating in the positive half cycle, Qb becomes cut off and the signal current flows as indicated by the solid arrows in Fig. 20. Point D potential at this time is the point A potential divided by R1 and R3. Also, point C potential is the point A potential divided by RE1 and RL (load). Point D is connected to Q1 base and point C to Q1 emitter through R2 and RE2. When RL is extremely small, the point C potential becomes considerably lower than point D. This potential difference forward biases Q1. Q1 turns ON and current flows in D3.

Qb operates in the negative half cycle and Qa becomes cut off. The signal flows is indicated by the broken line arrows in the center of Fig. 20. Q1 is biased by the potential difference between point C and point E. If RL is extremely small, the point C potential becomes considerably higher than that of point E. Q1 turns ON and current flows in D3.

If large current flows in Qa and Qb, Q1 becomes ON due to the RE1 and RE2 voltage drops, and current flows in D3. C1 prevents faulty operation due to external noise.

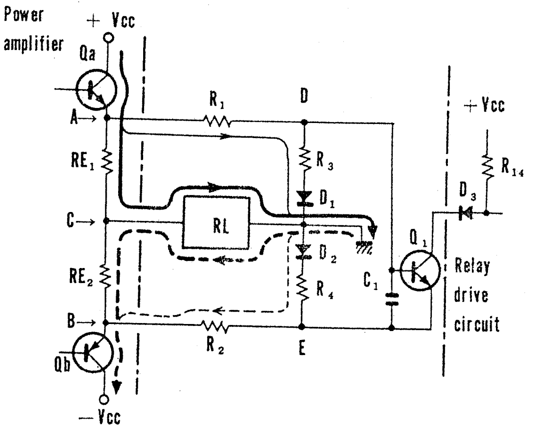


Fig. 20. Basic circuitry for overload detector

3. Center Point Potential Detector Circuit

If a DC potential is produced at the junction point of the power amplifier, a command is sent to the relay drive circuit. Fig. 21 shows this operating principle.

Q3 and Q4 compose a differential amplifier. When the same input is applied to both input terminals (Q3 and Q4 bases), no output is present. However, if there is a difference between the terminal inputs, the difference is amplified and becomes the output between the two collectors. During normal operation, an AC signal only is present at the junction point. As C2 reactance is sufficiently low, the same signal is applied to Q3 and Q4 bases, resulting in an absence of output at the collector sides.

When a DC potential is produced at the junction point, it becomes the input of Q3 only. If the voltage is negative, Q3 collector current declines And at Q4 the collector current increases and the potential drops, causing current to flow through D4.

If the DC voltage is positive, Q3 collector current increases and the potential drops, while at Q4 the collector current decreases and the potential rises. Current therefore flows through D5.

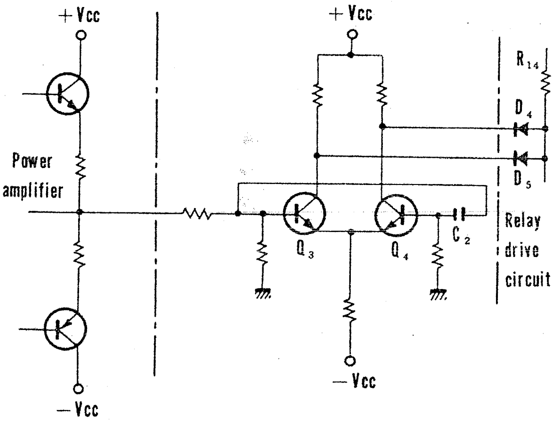


Fig. 21. Basic circuitry for center point potential detector

4.4 POWER SUPPLY CIRCUIT

All power supplied are regulated up to the power amplifier predriver stage. Independent power transformer secondary windings are employed for left and right channels in the power stage. Each channel is also supplied from an independent bridge rectifier and two 22,000μF capacitors. Position lamps are lighted by DC from a regulated power supply for stable illumination.

Inrush Current Suppressor Circuit

Ordinarily, power transformer inrush current when the power supply is turned on is opposed by DC resistance of the winding and instantaneous inductance of the air core. In the toroidal power transformer used in the SX-1250, both these factors are very low. Combined with the high charging current of the four 22,000μF capacitors in the secondary, inrush current can reach several hundred amperes. A resistors is therefore provided in series with the primary coil to suppress this inrush current to several tens of amperes. This resistor becomes shorted after power transformer excitation.

The inrush suppressor circuit is shown in Fig. 22. S1 is the POWER switch and S2 a relay contact. The Microtemp is a temperature responding fuse. S2 is open before power is turned on, connecting the power transformer primary coil in series with R1 and the Microtemp. After power has been turned on, the relay operates when DC current is obtained from the rectifier, closing S2. If S2 fails to close, due to power supply or relay malfunction, R1 heating opens the Microtemp (109°C operating temperature), thus opening the primary circuit.

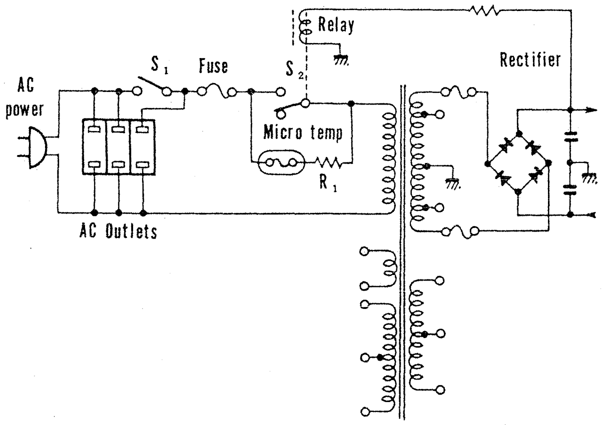
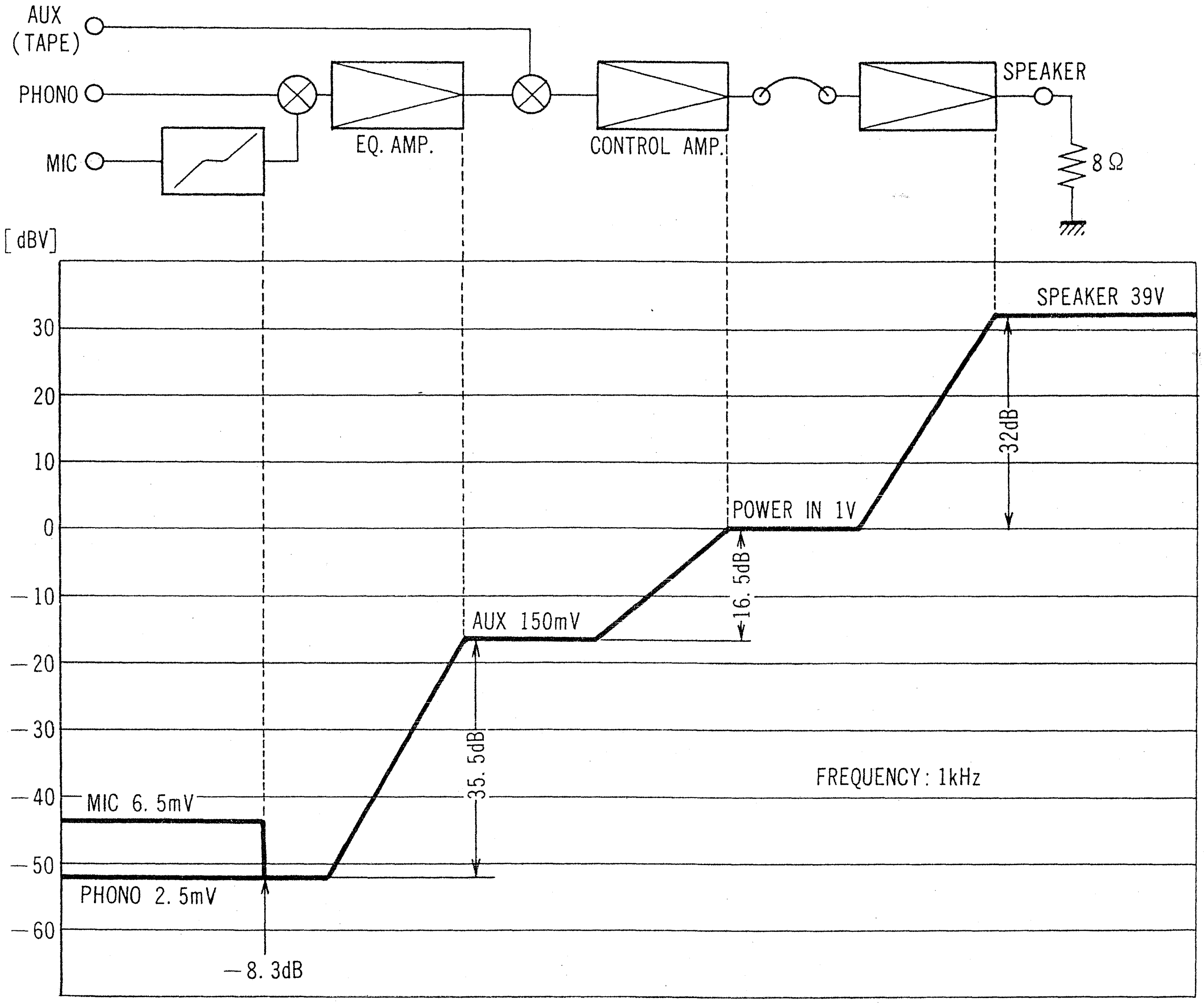
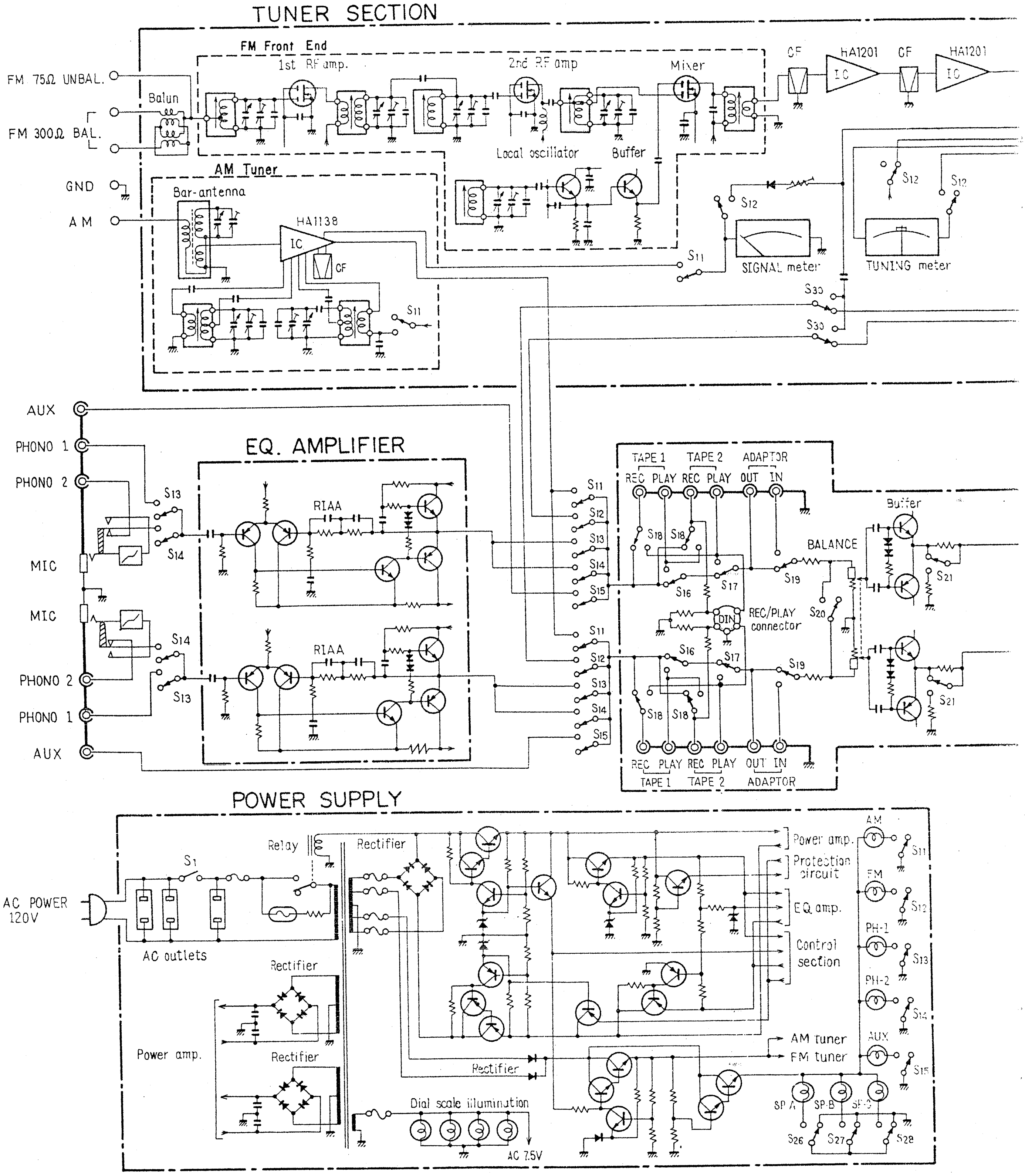

Relay
S₁
Fuse
S₂
Rectifier
AC
power
Micro temp
R₁
AC Outlets

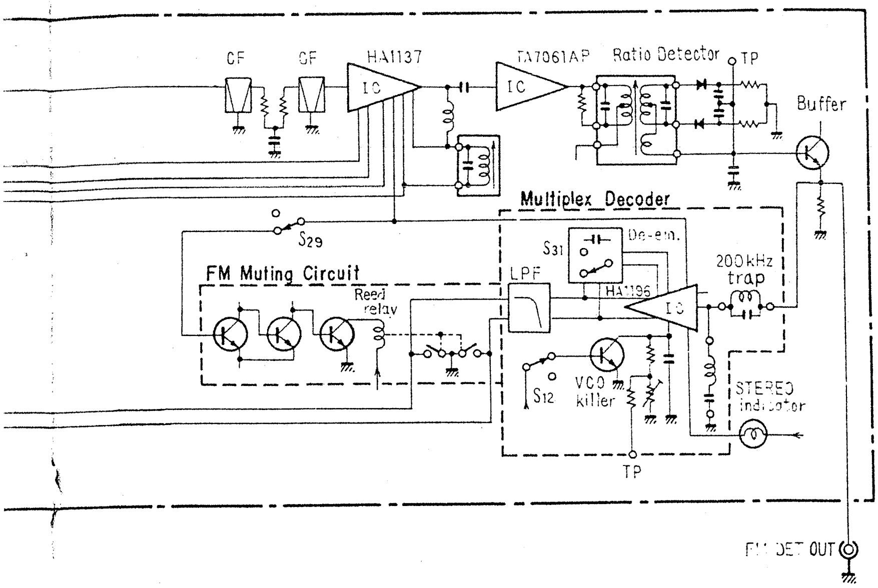
Fig. 22. Basic circuitry for inrush current suppressor

5. LEVEL DIAGRAM



6. BLOCK DIAGRAM


TUNER SECTION
FM Front End
1st RF amp.
2nd RF amp
Mixer
CF
HA1201
IC
CF
HA1201
IC
FM 75Ω UNBAL.
Balun
FM 300Ω BAL.
Local oscillator
Buffer
GND
AM Tuner
Bar-antenna
AM
HA1138
IC
CF
S11
S12
S12
S12
S11
SIGNAL meter
TUNING meter
S30
S30
AUX
PHONO 1
PHONO 2
EQ. AMPLIFIER
RIAA
S13
S14
MIC
MIC
S14
S13
RIAA
PHONO 2
PHONO 1
AUX
S11
S12
S13
S14
S15
TAPE 1
TAPE 2
ADAPTOR
REC PLAY REC PLAY OUT IN
S18
S18
S16
S17
Buffer
BALANCE
S19
S20
S21
DIN
REC/PLAY connector
S16
S17
S19
S21
S18
S18
REC PLAY REC PLAY OUT IN
TAPE 1
TAPE 2
ADAPTOR
POWER SUPPLY
Relay
Rectifier
S1
AC POWER 120V
AC outlets
Rectifier
Power amp.
Rectifier
Rectifier
Dial scale illumination
AC 7.5V
Power amp.
Protection circuit
EQ amp.
Control section
AM tuner
FM tuner
AM
S11
FM
S12
PH-1
S13
PH-2
S14
AUX
S15
SP A
SP B
SP C
S26
S27
S28


CF
CF
HA1137
IC
TA7061AP
IC
Ratio Detector
TP
Buffer
S29
Multiplex Decoder
S31
De-em.
FM Muting Circuit
LPF
HA1196
IC
200kHz trap
Reed relay
S12
VCO killer
STEREO indicator
TP
FM DET OUT

SWITCHES :

S1 : POWER

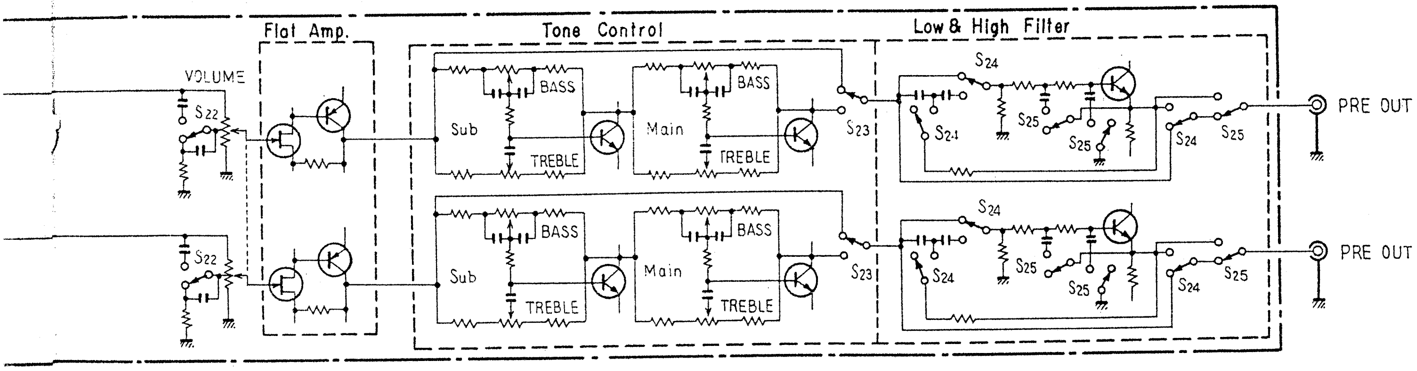
(FUNCTION)
S11 : AM
S12 : FM
S13 : PHONO 1
S14 : PHONO 2/MIC
S15 : AUX

S16 : TAPE MONITOR 1
S17 : TAPE MONITOR 2
S18 : TAPE DUPLICATE
S19 : ADAPTOR
S20 : MODE
S21 : MUTING
S22 : LOUDNESS
S23 : TONE
S24 : LOW FILTER
S25 : HIGH FILTER

(SPEAKERS)
S26 : SPEAKERS A
S27 : SPEAKERS B
S28 : SPEAKERS C

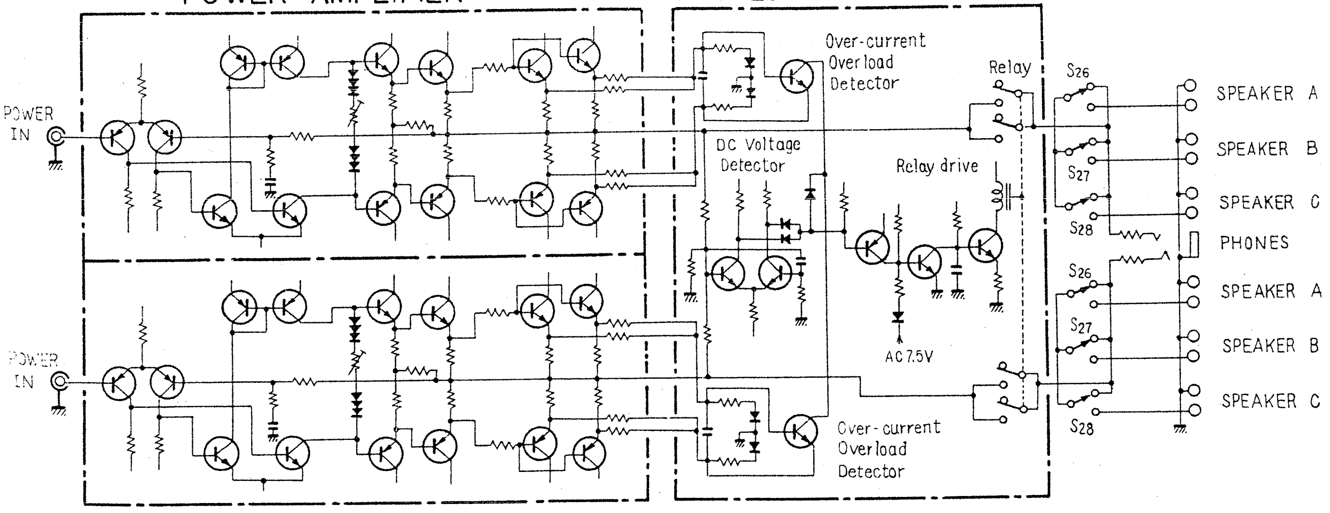
S29 : FM MUTING
S30 : FM MULTIPATH
S31 : FM DE-EMPHASIS

CONTROL SECTION


Flat Amp.
Tone Control
Low & High Filter
VOLUME
S22
Sub
BASS
TREBLE
Main
BASS
TREBLE
S23
S24
S24
S25
S25
S24
S25
PRE OUT
S22
Sub
BASS
TREBLE
Main
BASS
TREBLE
S23
S24
S24
S25
S25
S24
S25
PRE OUT

POWER AMPLIFIER

PROTECTION CIRCUT


POWER IN
Over-current Overload Detector
Relay
S26
SPEAKER A
SPEAKER B
S27
DC Voltage Detector
Relay drive
SPEAKER C
S28
PHONES
S26
SPEAKER A
S27
SPEAKER B
AC7.5V
SPEAKER C
S28
POWER IN
Over-current Overload Detector

7. DISASSEMBLY

Top Plate

Remove the six screws (A) to detach the top plate.

Wooden Cover

Remove the two screws (B) on each side of the wooden cover.

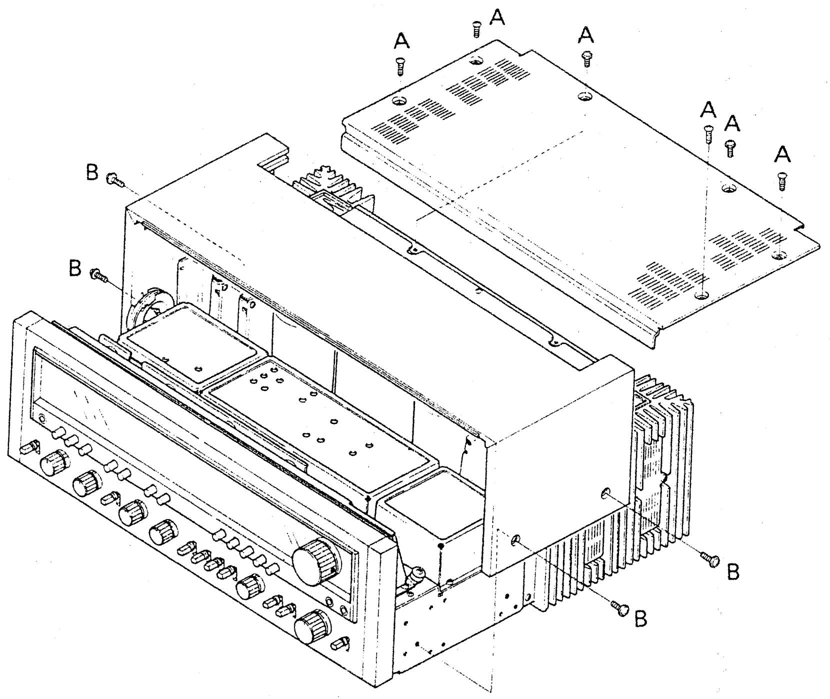


Fig. 25

Bottom Plate

Remove the fifteen screws to detach the bottom plate.

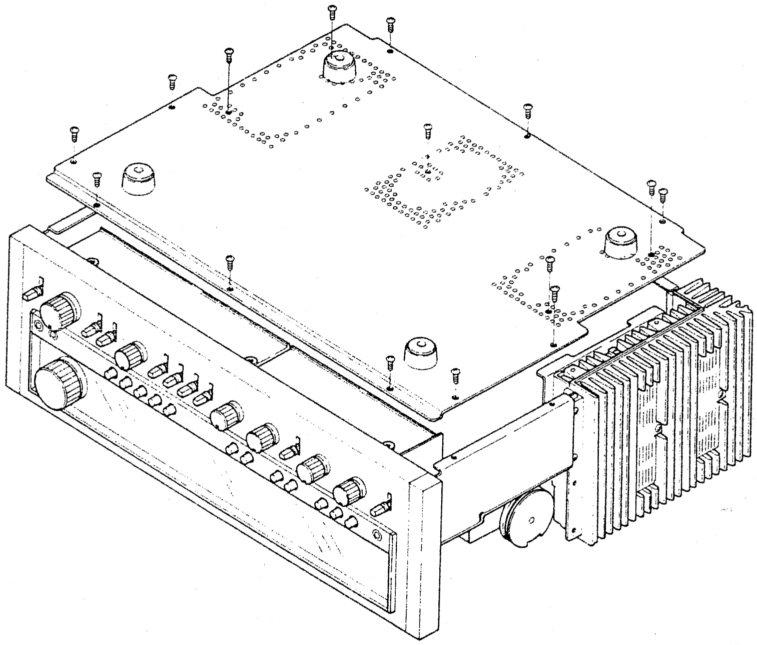


Fig. 26

Front Panel

Loosen the setscrews of TUNING and VOLUME knobs with a hexagonal wrench. Remove all the knobs by pulling. Remove the two screws from the top edge of the front panel. Remove the three nuts from the sub-tone and volume control shafts.

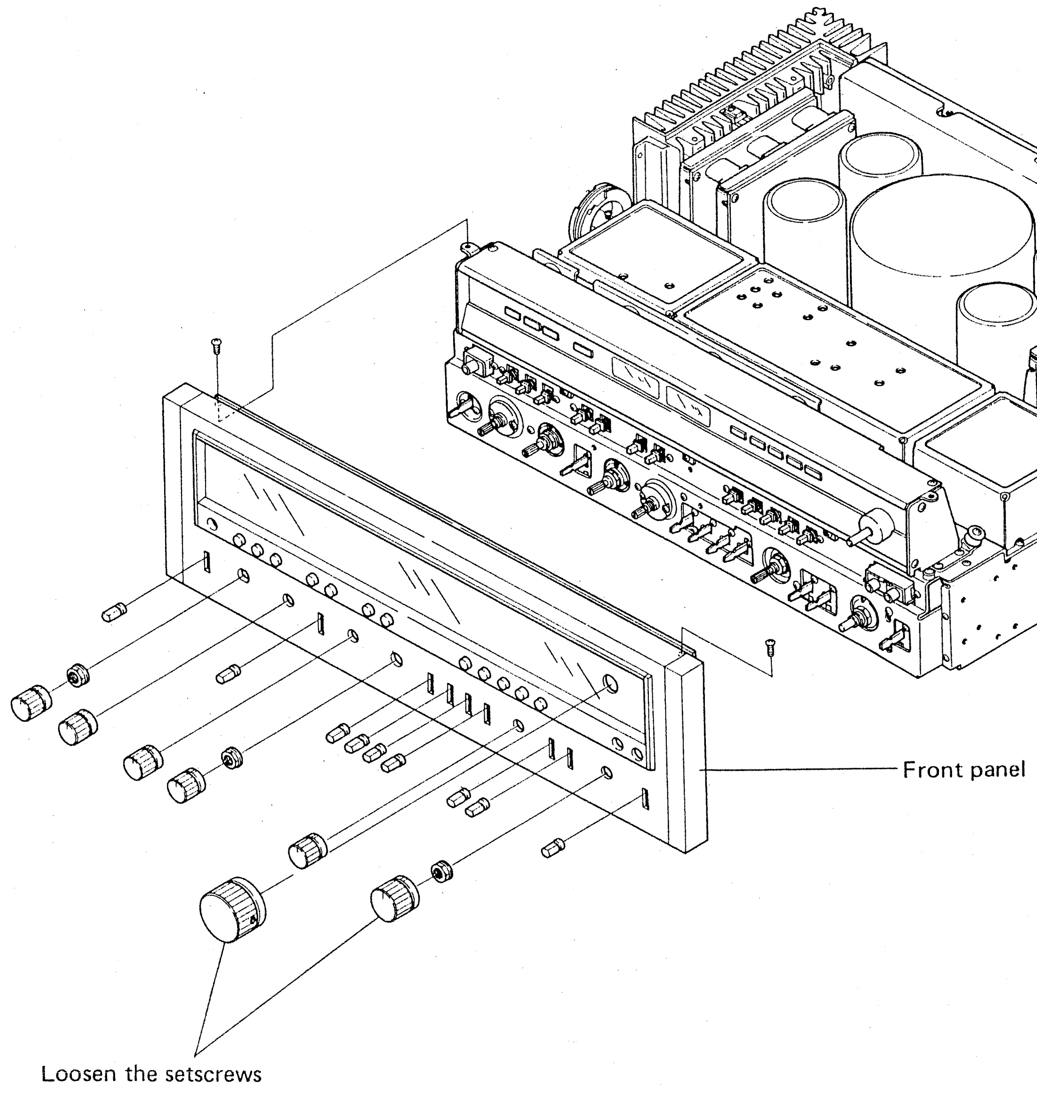
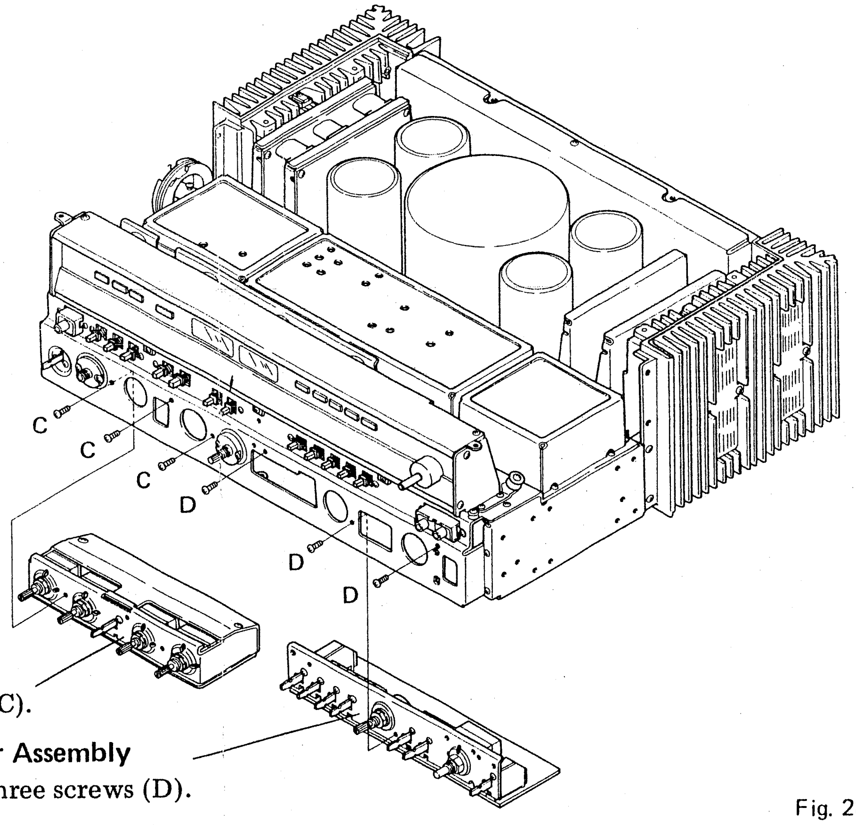


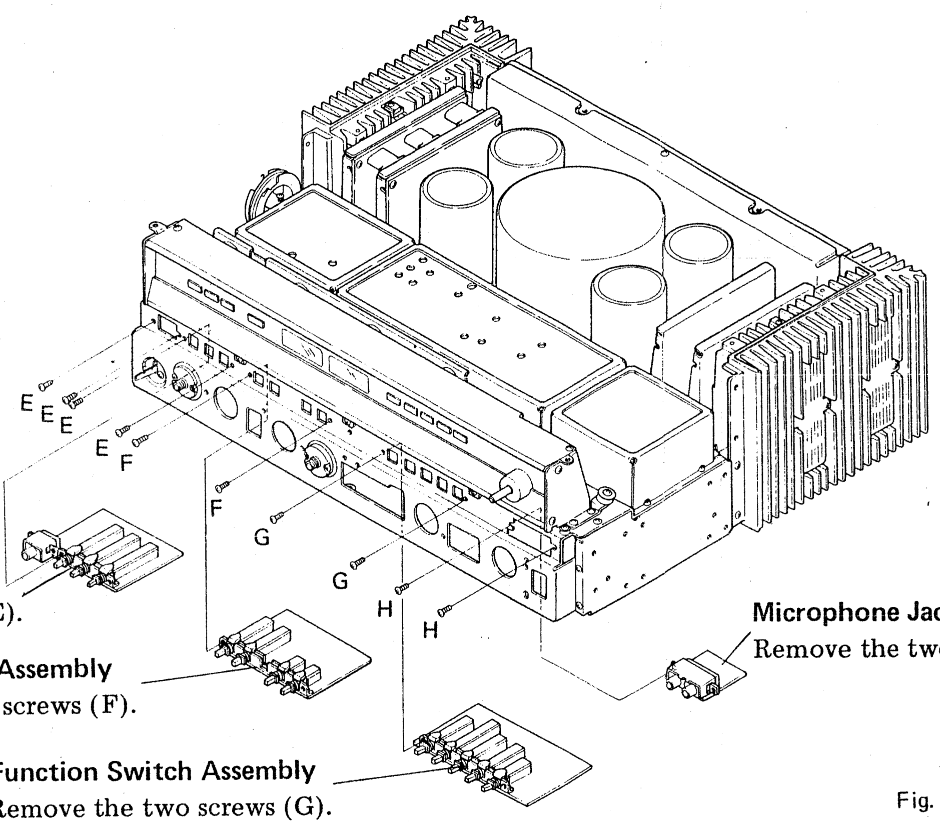
Fig. 27



Tone Amplifier Assembly
Remove the three screws (C).

Flat Amplifier Assembly
Remove the three screws (D).

Fig. 28



Speakers Switch Assembly
Remove the four screws (E).

Filter Amplifier Assembly
Remove the two screws (F).

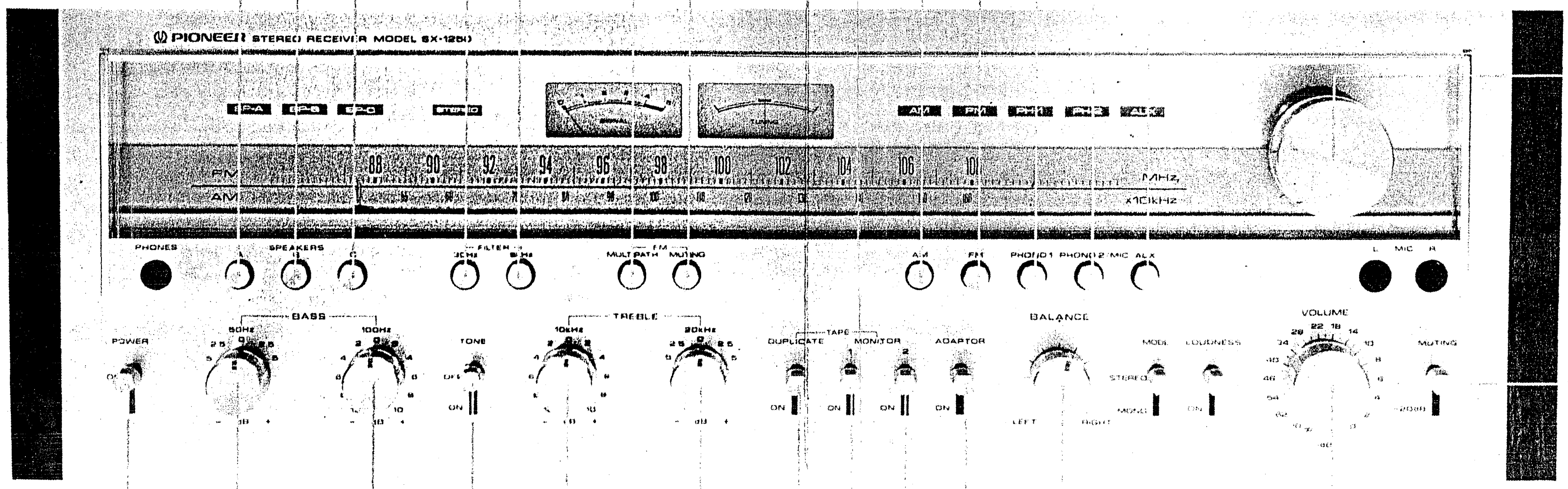
Function Switch Assembly
Remove the two screws (G).

Microphone Jack Assembly
Remove the two screws (H).

Fig. 29

8. PARTS LOCATION

8.1 FRONT PANEL VIEW



Knob (FILTER 8kHz)
AAD-114

Knob (FM MULTIPATH)
AAD-114

Knob (FM MUTING)
AAD-114

Front panel assembly
ANB-386

Knob (FILTER 30Hz)
AAD-114

Knob (SPEAKERS C)
AAD-114

Knob (SPEAKERS B)
AAD-114

Knob (SPEAKERS A)
AAD-114

Knob (POWER)
AAD-113

Knob (BASS 50Hz)
AAB-100

Knob (BASS 100Hz)
AAB-100

Knob (TONE)
AAD-113

Knob (TREBLE 10kHz)
AAB-100

Knob (TREBLE 20kHz)
AAB-100

Knob (TAPE MONITOR 1)
AAD-113

Knob (TAPE DUPLICATE)
AAD-113

Knob (AM)
AAD-114

Knob (FM)
AAD-114

Knob (PHONO 1)
AAD-114

Knob (PHONO 2/MIC)
AAD-114

Knob (AUX)
AAD-114

Knob (Tuning)
AAA-034

Knob (MUTING)
AAD-113

Knob (VOLUME)
AAB-104

Knob (LOUDNESS)
AAD-113

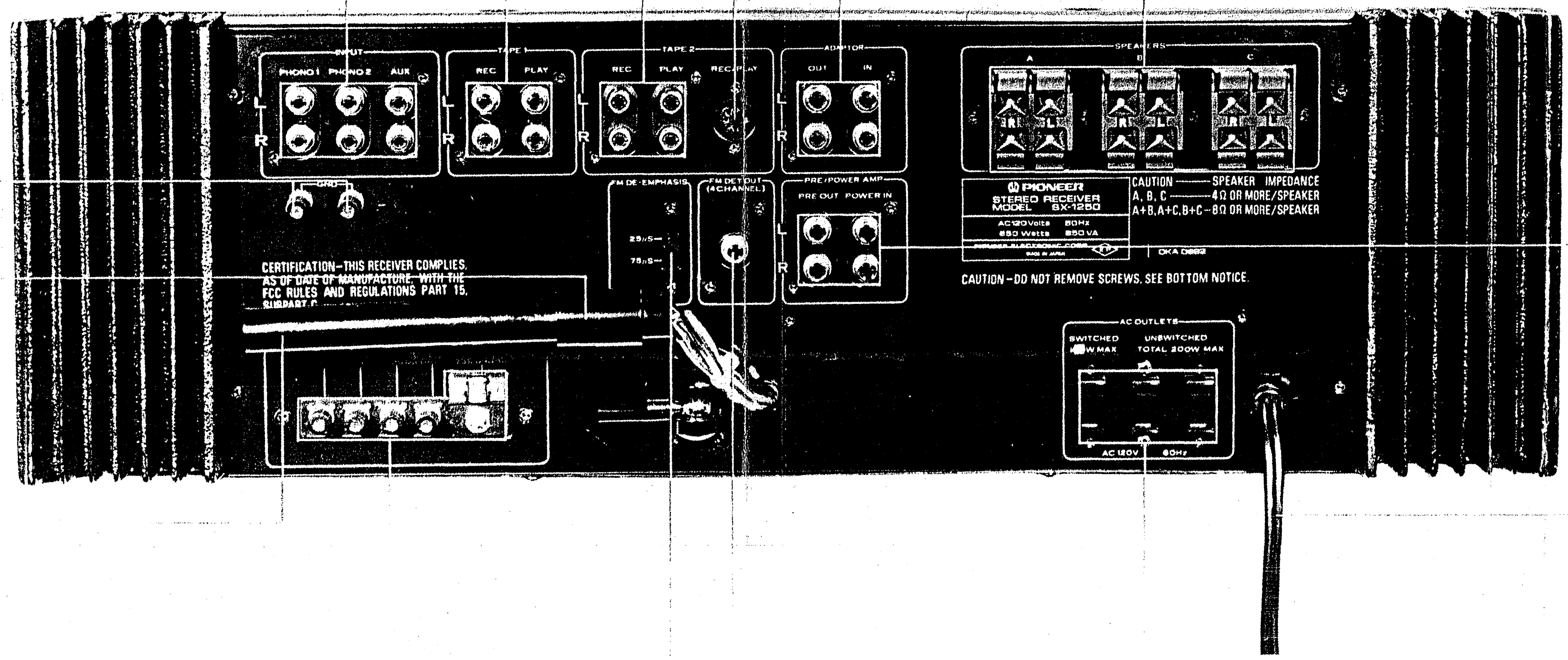
Knob (MODE)
AAD-113

Knob (BALANCE)
AAB-100

Knob (ADAPTOR)
AAD-113

Knob (TAPE MONITOR 2)
AAD-113

8.2 REAR PANEL VIEW


INPUT
PHONO 1
PHONO 2
AUX
L
R
TAPE 1
REC
PLAY
TAPE 2
REC/PLAY
ADAPTOR
OUT
IN
SPEAKERS
A
B
C
GND
FM DE-EMPHASIS
25µS
75µS
FM DET OUT (4CHANNEL)
PRE/POWER AMP
PRE OUT
POWER IN
PIONEER
STEREO RECEIVER
MODEL SX-1250
CAUTION — SPEAKER IMPEDANCE
A, B, C — 4Ω OR MORE/SPEAKER
A+B, A+C, B+C — 8Ω OR MORE/SPEAKER
CAUTION—DO NOT REMOVE SCREWS. SEE BOTTOM NOTICE.
CERTIFICATION—THIS RECEIVER COMPLIES. AS OF DATE OF MANUFACTURE, WITH THE FCC RULES AND REGULATIONS PART 15, SUBPART C
AC OUTLETS
SWITCHED
UNSWITCHED
TOTAL 200W MAX
AC 120V
60Hz

Terminal (TAPE 2)
AKB-030

Terminal (TAPE 1)
AKB-030

Terminal (INPUT)
AKB-033

Terminal (GND)
AKE-012

Bar-antenna holder
W72-092

Ferrite bar-antenna
ATB-051

Terminal (ANTENNA)
AKA-004

Slide switch (DE-EMPHASIS)
ASH-015

Connector socket 5P (REC/PLAY)
AKP-007

Terminal (ADAPTOR)
AKB-030

Terminal (SPEAKERS)
AKE-014

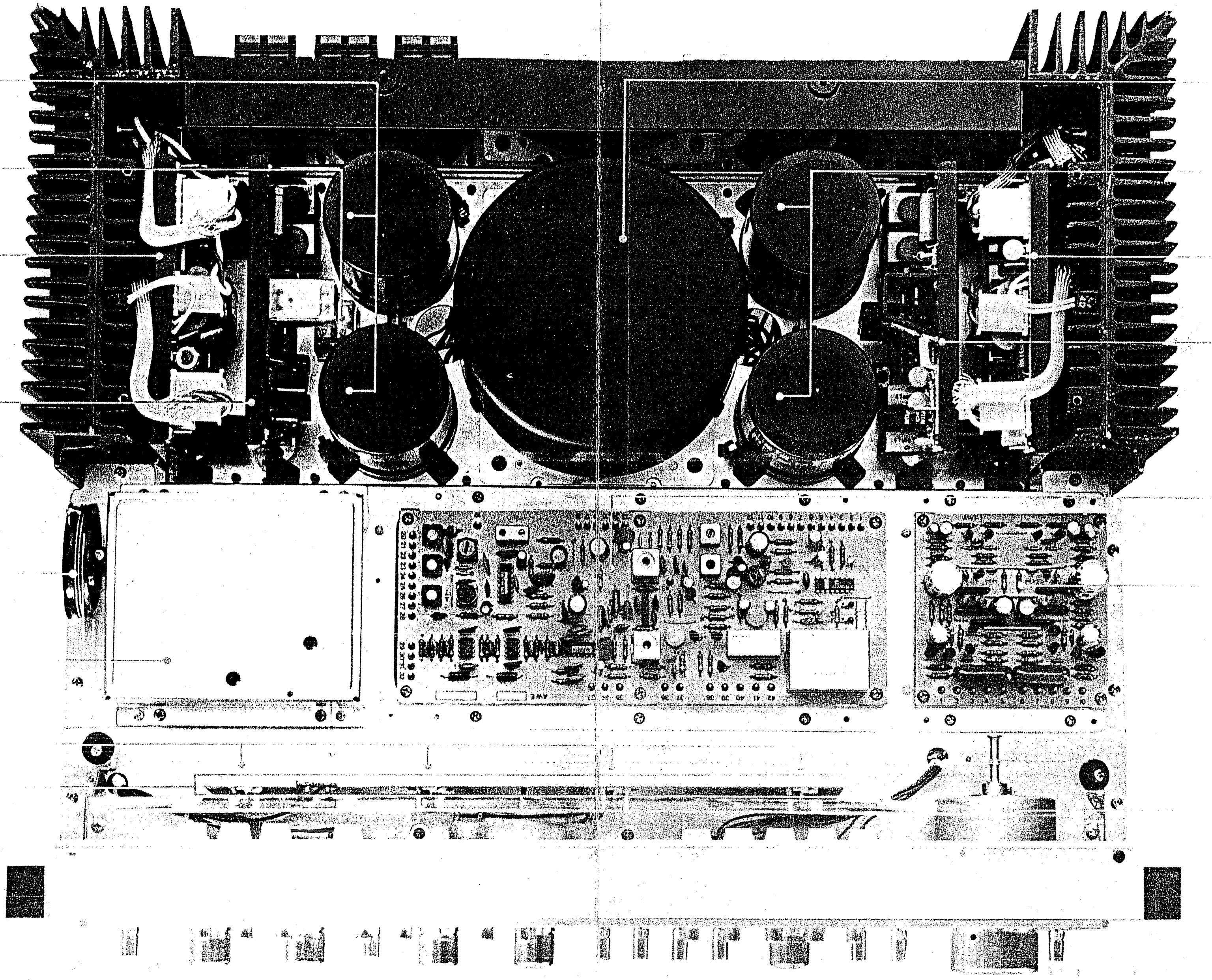
Terminal (PRE/POWER AMP)
AKB-030

AC power cord
ADG-013

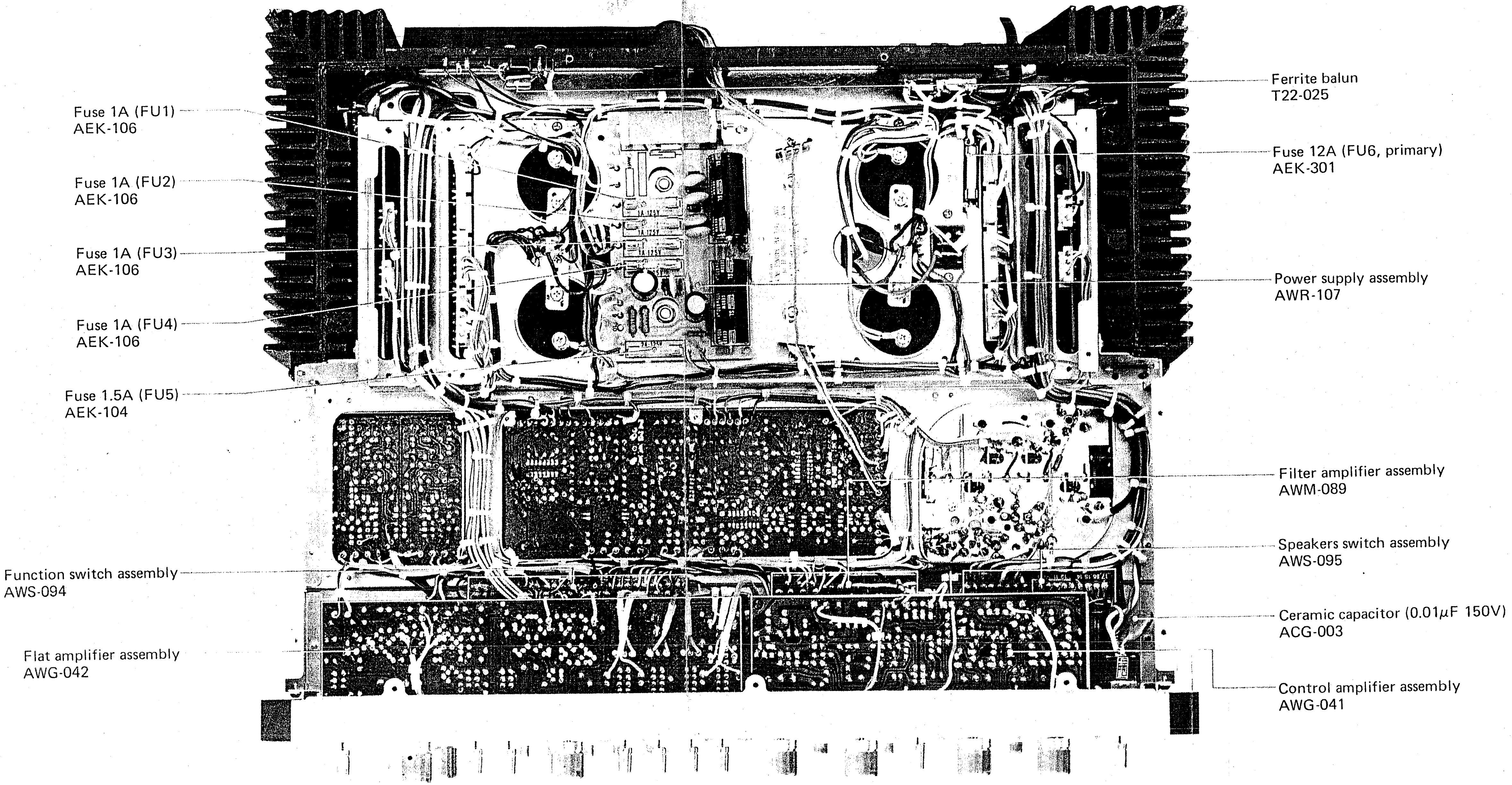
AC socket (AC OUTLETS)
AKP-005

Terminal (FM DET OUT)
AKB-019

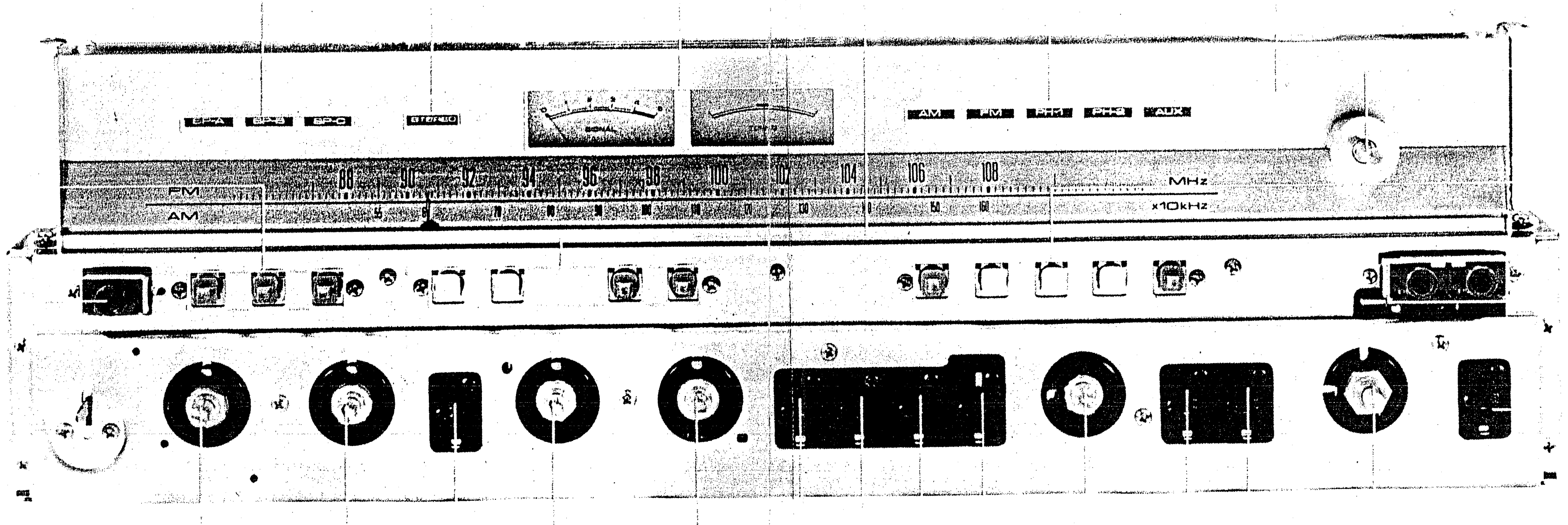
8.3 TOP VIEW


Electrolytic capacitor (22,000μF 80V)
ACH-056
Relay (S2)
ASR-015
Power amplifier assembly
AWH-048
Protection circuit assembly
AWM-091
Tuning drum assembly
AXA-070
FM front end
AWB-023
Lamp assembly (PL1—PL4, 8V 0.3A)
AEL-056
Lamp board assembly
AWX-096
Power transformer
ATT-267
Electrolytic capacitor (22,000μF 80V)
ACH-056
Power amplifier assembly
AWH-048
Stabilizer assembly
AWR-106
Tuner assembly
AWE-068
Equalizer amplifier assembly
AWF-021
Tuning shaft assembly
AXA-111

8.4 BOTTOM VIEW


Fuse 1A (FU1)
AEK-106
Fuse 1A (FU2)
AEK-106
Fuse 1A (FU3)
AEK-106
Fuse 1A (FU4)
AEK-106
Fuse 1.5A (FU5)
AEK-104
Function switch assembly
AWS-094
Flat amplifier assembly
AWG-042
Ferrite balun
T22-025
Fuse 12A (FU6, primary)
AEK-301
Power supply assembly
AWR-107
Filter amplifier assembly
AWM-089
Speakers switch assembly
AWS-095
Ceramic capacitor (0.01μF 150V)
ACG-003
Control amplifier assembly
AWG-041

8.5 FRONT VIEW



Indicator (STEREO)
AAT-028

Indicator (SP-A, SP-B, SP-C)
AAT-026

Push switch (SPEAKERS)
ASG-094

Phone jack (PHONES)
AKN-010

Lever switch (POWER)
ASK-080

Variable resistor (102k, 5-step, BASS 50Hz)
ACV-165

Variable resistor (102.6k, 11-step, BASS 100Hz)
ACV-166

Lever switch (TONE)
ASK-090

Variable resistor (99k, 11-step, TREBLE 10kHz)
ACV-167

Variable resistor (102k, 5-step, TREBLE 20kHz)
ACV-168

Lever switch (TAPE MONITOR 2)
ASK-092

Lever switch (TAPE MONITOR 1)
ASK-092

Lever switch (DUPLICATE)
ASK-084

Double meter (SIGNAL/TUNING)
AAW-040

Push switch (FILTER, FM MUTING,
MULTIPATH)
ASG-098

Indicator
AAT-027

Dial scale plate
AAG-106

Tuning shaft assembly
AXA-111

Push switch (AM, FM, PHONOI,
PHONO2/MIC)
ASG-095

Phone jack (MIC)
AKN-013

Lever switch (MUTING)
ASK-090

Variable resistor (50k, 32-step, VOLUME)
ACV-169

Lever switch (LOUDNESS)
ASK-090

Lever switch (MODE)
ASK-090

Variable resistor (100k-HB, BALANCE)
ACV-163

Lever switch (ADAPTOR)
ASK-092

9. ADJUSTMENTS

9.1 AM TUNER

1. Set function switch to AM.
2. Connect AM signal generator through 1k-ohm resistor to AM antenna terminal.
3. Set DUPLICATE switch to OFF and connect an AC voltmeter to TAPE 1 REC jacks.
4. Set AM SG for 400Hz 30% modulation 100dB output.
5. Set SX-1250 dial indication and AM SG frequency for 600kHz.
6. Adjust T3 core for maximum reading on AC voltmeter.
7. Set SX-1250 dial indication and AM SG frequency for 1,400kHz.
8. Adjust TC1 for maximum reading on AC voltmeter.
9. Set AM SG for 30dB output.
10. Set SX-1250 dial indication and AM SG frequency for 600kHz.
11. Adjust T3, T4 and bar antenna core for maximum reading on AC voltmeter.
12. Set SX-1250 dial indication and AM SG frequency for 1,400kHz.
13. Adjust TC1, TC2 and TC3 for maximum reading on AC voltmeter.
14. Repeat steps 10~13 to eliminate variations in AC voltmeter readings.

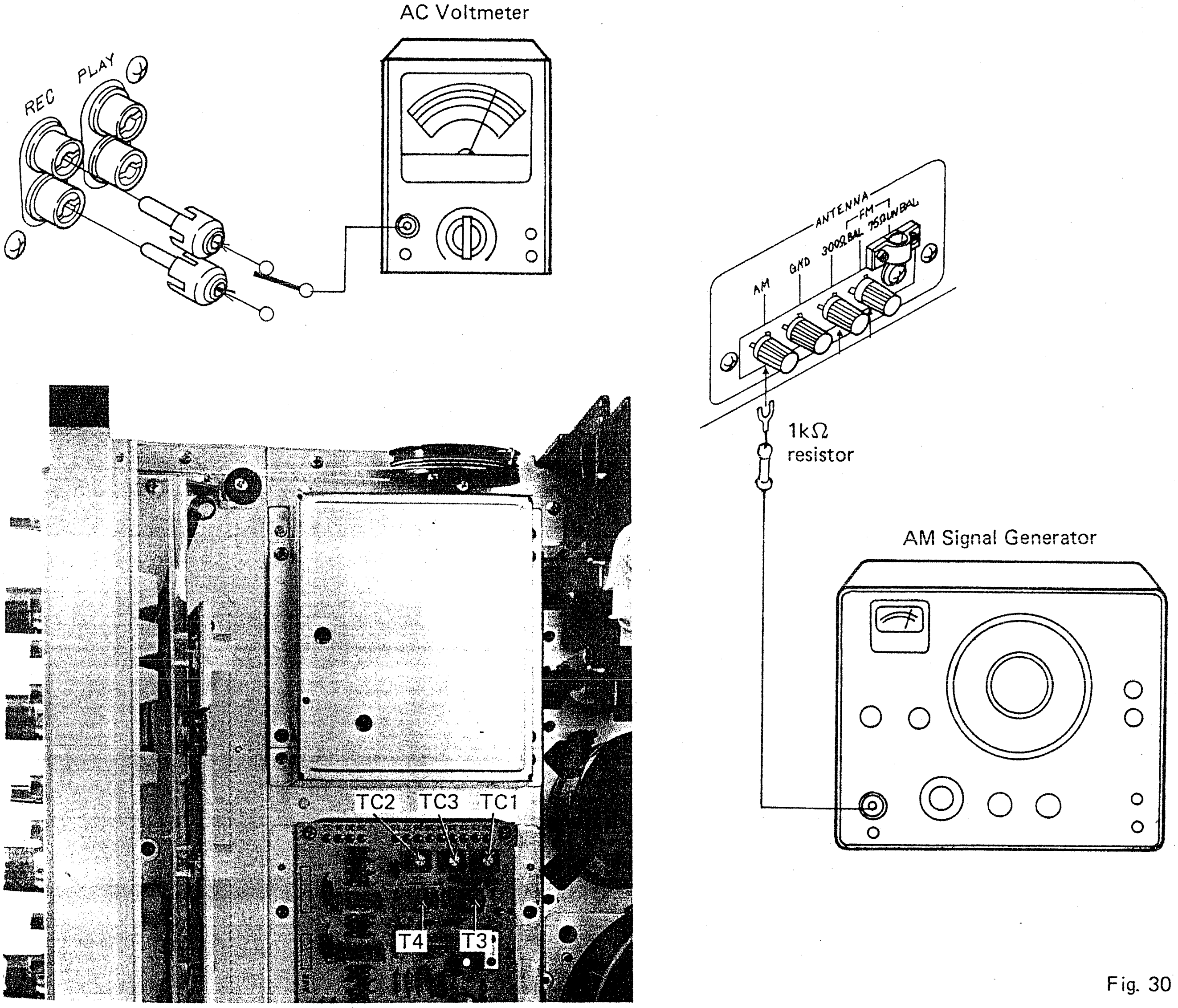

AC Voltmeter
PLAY
REC
ANTENNA
FM
AM
GND
300Ω BAL
75Ω UNBAL
1kΩ
resistor
AM Signal Generator
TC2
TC3
TC1
T4
T3

Fig. 30

9.2 FM TUNER

FM Front End

1. Set function switch to FM.
2. Set FM MUTING switch to OFF.
3. Connect FM signal generator through 300-ohm dummy load to 300 ohm FM antenna terminals.
4. Set DUPLICATE switch to OFF and connect AC voltmeter to TAPE 1 REC jacks.
5. Set FM SG for 100dB output at 400Hz and 100% modulation.
6. Set SX-1250 dial indication and FM SG frequency for 87.4MHz.
7. Adjust T5 core for maximum indication on SIGNAL meter.
8. Set FM SG for 8dB output and adjust cores of T1, T2, T3 and T4 for maximum reading on AC voltmeter.
9. Set FM SG for 100dB output.
10. Set SX-1250 dial indication and FM SG frequency for 106MHz.
11. Adjust TC5 for maximum indication on SIGNAL meter.
12. Set FM SG for 8dB output and adjust TC1, TC2, TC3 and TC4 for maximum reading on AC voltmeter.
13. Repeat steps 5 ~ 12 to eliminate variations in AC voltmeter readings.
14. After completing above adjustments, adjust T6 core for maximum reading on AC voltmeter.

Bottom View of FM Front End

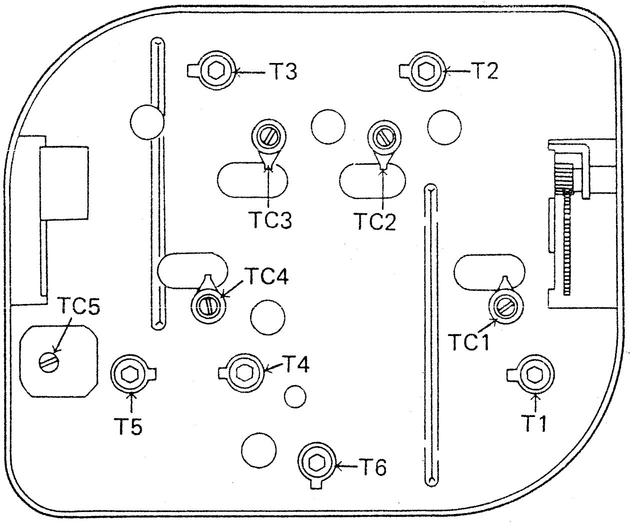


Fig. 31

Tuner Assembly

15. Connect DC voltmeter to terminal No.43.
16. Turn VR1 and VR3 fully counter-clockwise.
17. Detune SX-1250 to where only noise is received and adjust T1 core for center of scale indication on TUNING meter.
18. Set FM SG for 98MHz 60dB output.
19. Tune SX-1250 for exact center of scale indication on TUNING meter.
20. Adjust T2 upper core for 0V (±10mV) between terminal No.43 and ground.
21. Adjust T2 lower core for minimum distortion.
22. Repeat steps 20 – 21 several times.
23. Set FM SG for 100dB output and adjust VR1 so that SIGNAL meter indicates 4.7 on the scale.

Multiplex Decoder

24. Connect MPX SG (multiplex signal generator) to the external modulator terminals of the FM SG and set the FM SG for external modulation.
25. Connect PILOT OUT terminal of MPX SG to horizontal input terminal of oscilloscope.
26. Using a probe, connect oscilloscope vertical input terminal to terminal No. 9.
27. Set FM SG for 98MHz 60dB output unmodulated.
28. Tune SX-1250 for exact center of scale indication on TUNING meter.
29. Adjust VR2 so that 4 : 1 frequency ratio Lissajous' (see note below) figure becomes stationary.
30. Set FM SG for 1kHz (L or R), ±67.5kHz deviation, 19kHz (pilot signal) and ±7.5kHz modulation.
31. Adjust VR3 for minimum L-R crosstalk.

Note:
Signal at terminal No. 9 is 76kHz sawtooth wave and MPX SG pilot out is a 19kHz sinewave. These form a Lissajous' figure such as shown in Fig. 32.

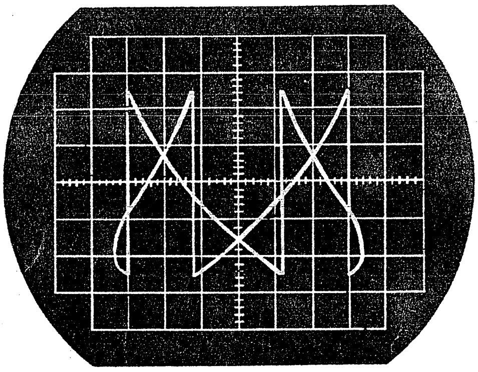


Fig. 32

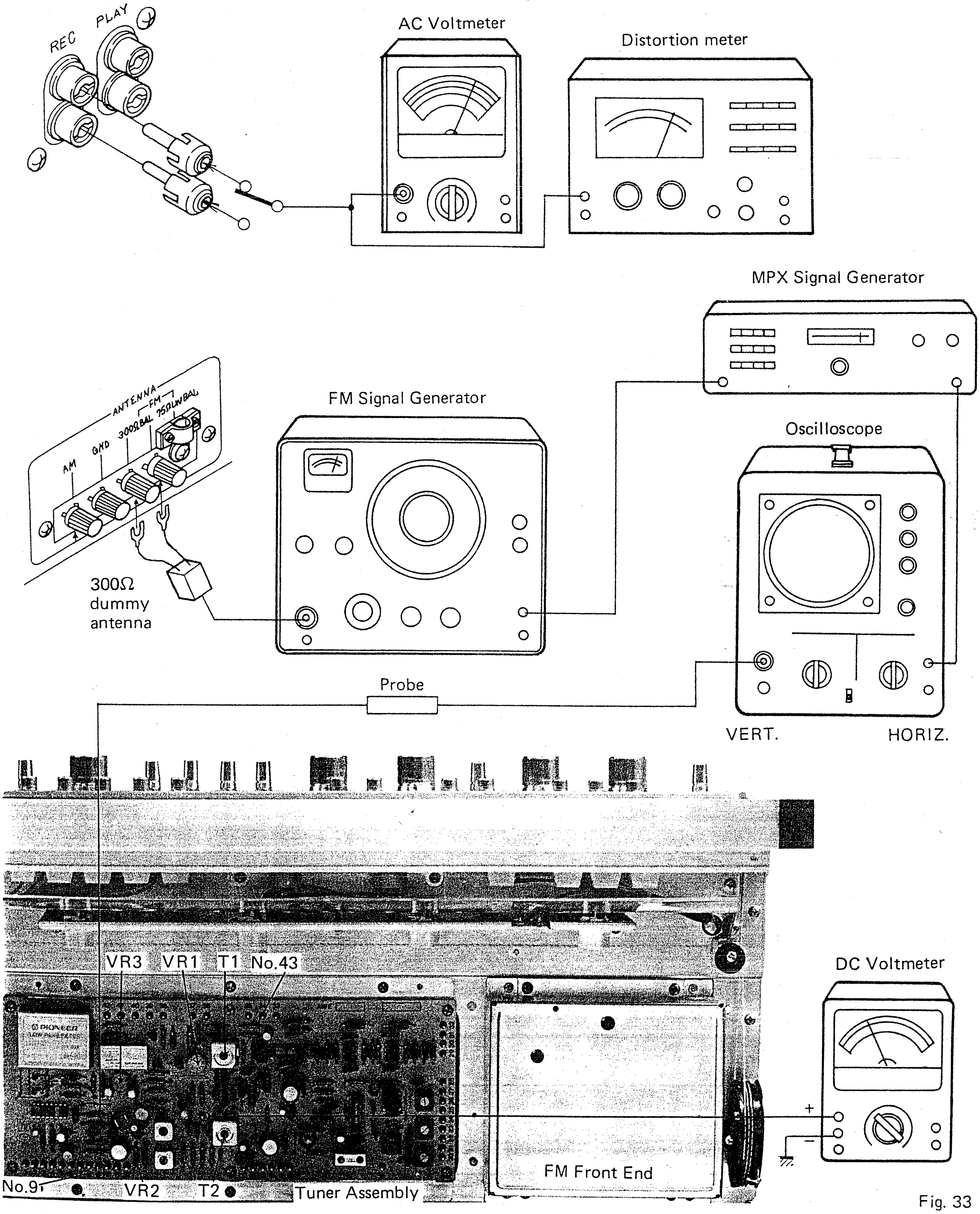

REC
PLAY
AC Voltmeter
Distortion meter
MPX Signal Generator
ANTENNA
FM
AM
GND
300Ω BAL
75Ω UNBAL
300Ω
dummy
antenna
FM Signal Generator
Oscilloscope
Probe
VERT.
HORIZ.
VR3
VR1
T1
No.43
DC Voltmeter
+
−
No.9
VR2
T2
Tuner Assembly
FM Front End

Fig. 33

9.3 POWER AMPLIFIER

1. Turn VR2 fully counter-clockwise before turning on the power.
2. Remove jumper plugs connecting POWER IN and PRE OUT jacks.
3. Connect 5.1 k-ohm resistor to POWER IN jacks.
4. Set power amplifier for no load.
5. Set POWER switch to ON.
6. Adjust VR1 for 0V between terminal No. 9 and ground.
7. Adjust VR2 for 100mV between terminals No. 7 (+) and No. 19 (−).
8. Allow set to warm up for at least 10 minutes, then readjust.

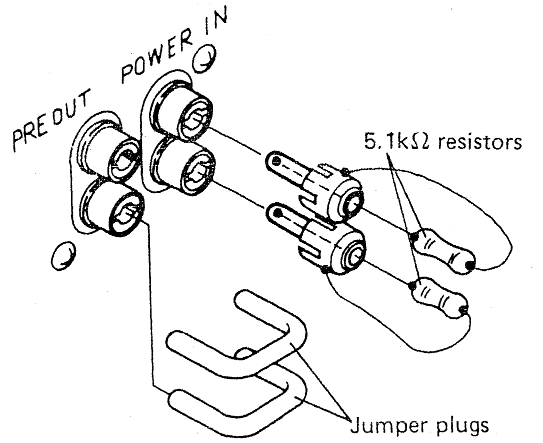
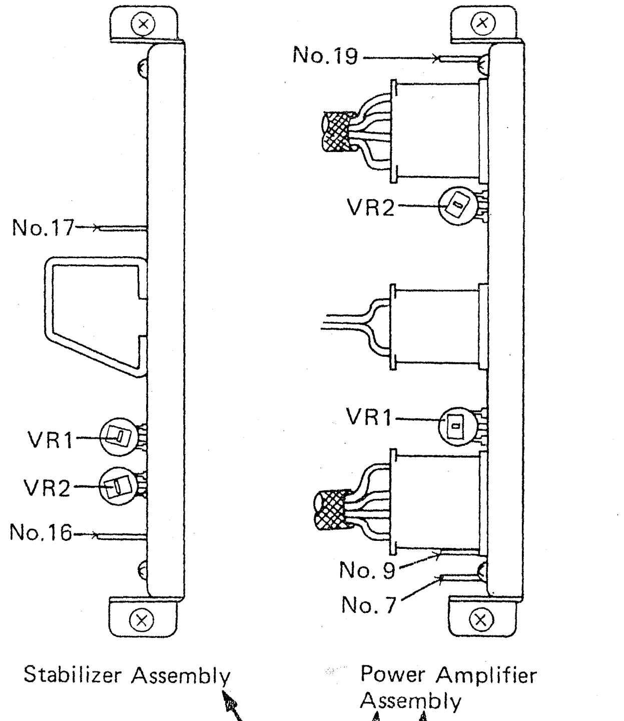

POWER IN
PRE OUT
5.1kΩ resistors
Jumper plugs

Fig. 34

9.4 STABILIZER

1. Adjust VR1 for 65V between terminals No.17 (+) and No.12 (ground).
2. Adjust VR2 for 65V between terminals No.12 (ground) and No.16 (−).


No.17
VR1
VR2
No.16
No.19
VR2
VR1
No. 9
No. 7
Stabilizer Assembly
Power Amplifier Assembly

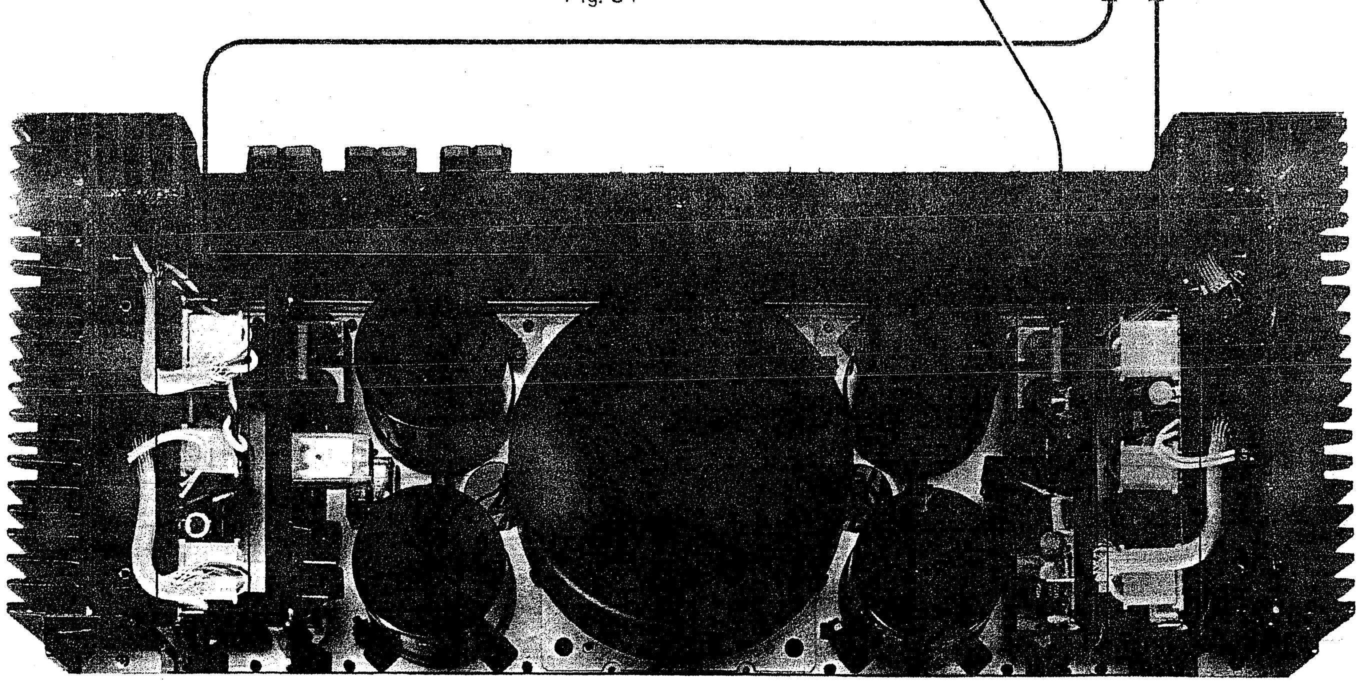


Fig. 35

10. DIAL CORD STRINGING

1. Remove the wooden cover and the front panel.
2. Remove the three screws to detach the blind sash (Fig. 36).
3. Turn tuning drum fully clockwise (as viewed from X direction in Fig. 37).
4. Tie one end of cord to stud on inner section of tuning drum (more easily performed by loosening setscrew and temporarily removing tuning drum from shaft).
5. Route cord through tuning drum cutout, make a half turn around the drum, then route in sequence to pulley A.
6. Wind cord 3 turns clockwise (as viewed from rear panel) around tuning shaft, then route to pulley B—pulley C—pulley D.
7. Wind cord two turns around tuning drum and tie to spring hook so that tension is applied to the cord.
8. Turn TUNING knob and confirm normal cord motion, then trim off excess cord.
9. Turn the tuning knob fully counterclockwise and fix the dial pointer to cord so that it indicates 87.4MHz on the dial scale.

Dial Pointer Installation Caution

Metal portion of dial pointer is plated. If this section is touched directly by hand or fingerprints and other impurities, it is difficult to remove dirt from aventurine finish. As this is not desirable in terms of both appearance and anticorrosion, take extreme care not to touch the metal section when handling the dial pointer.

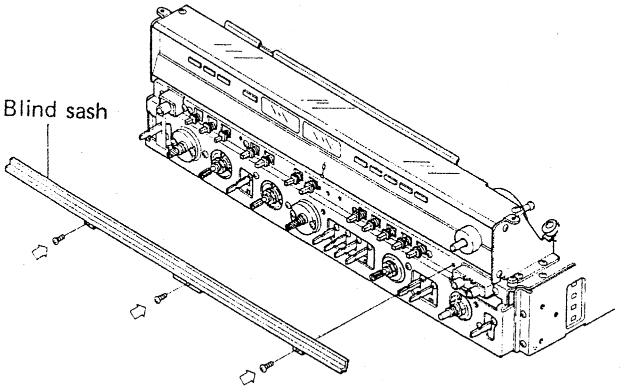


Fig. 36

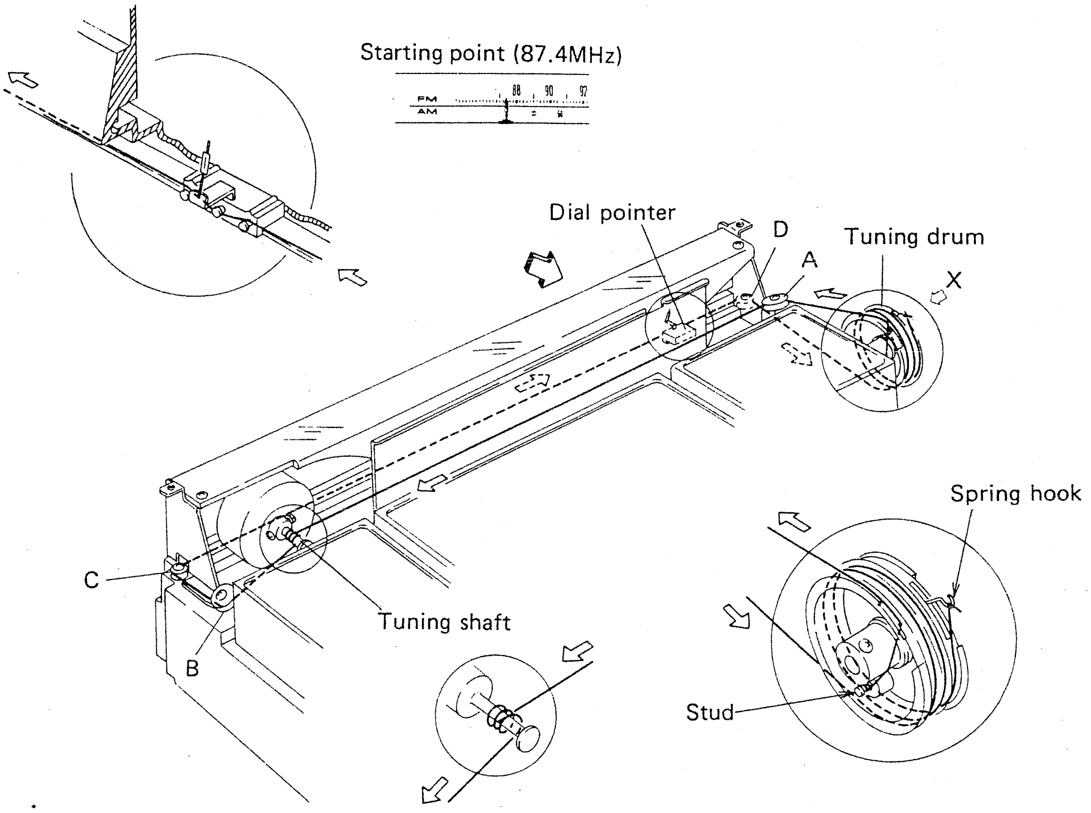
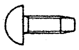
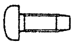
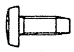
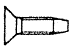
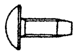
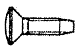
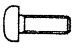
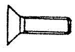
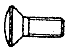
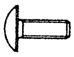
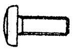
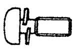
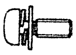
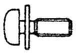


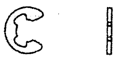
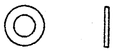
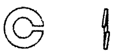
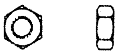
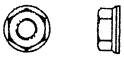
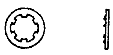
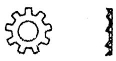
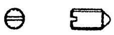
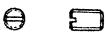
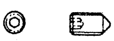
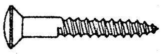
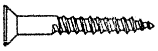
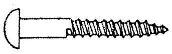
Fig. 37

11. EXPLODED VIEWS

NOMENCLATURE OF SCREWS, WASHERS AND NUTS

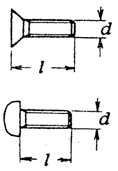
The following symbols stand for screws, washers and nuts as shown in exploded view.

Symbol	Description	Shape
RT	Brazier head tapping screw	
PT	Pan head tapping screw	
BT	Binding head tapping screw	
CT	Countersunk head tapping screw	
TT	Truss head tapping screw	
OCT	Oval countersunk head tapping screw	
PM	Pan head machine screw	
CM	Countersunk head machine screw	
OCM	Oval countersunk head machine screw	
TM	Truss head machine screw	
BM	Binding head machine screw	
PSA	Pan head screw with spring lock washer	
PSB	Pan head screw with spring lock washer and flat washer	
PSF	Pan head screw with flat washer	

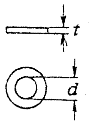
Symbol	Description	Shape
EW	E type washer	
FW	Flat washer	
SW	Spring lock washer	
N	Nut	
WN	Washer faced nut	
ITW	Internal toothed lock washer	
OTW	Outernal toothed lock washer	
SC	Slotted set screw (Cone point)	
SF	Slotted set screw (Flat point)	
HS	Hexagon socket headless set screw	
OCW	Oval countersunk head wood screw	
CW	Countersunk head wood screw	
RW	Round head wood screw	

EXAMPLE

PM 3x8
length in mm (*l*)
diameter in mm (*d*)
Symbol

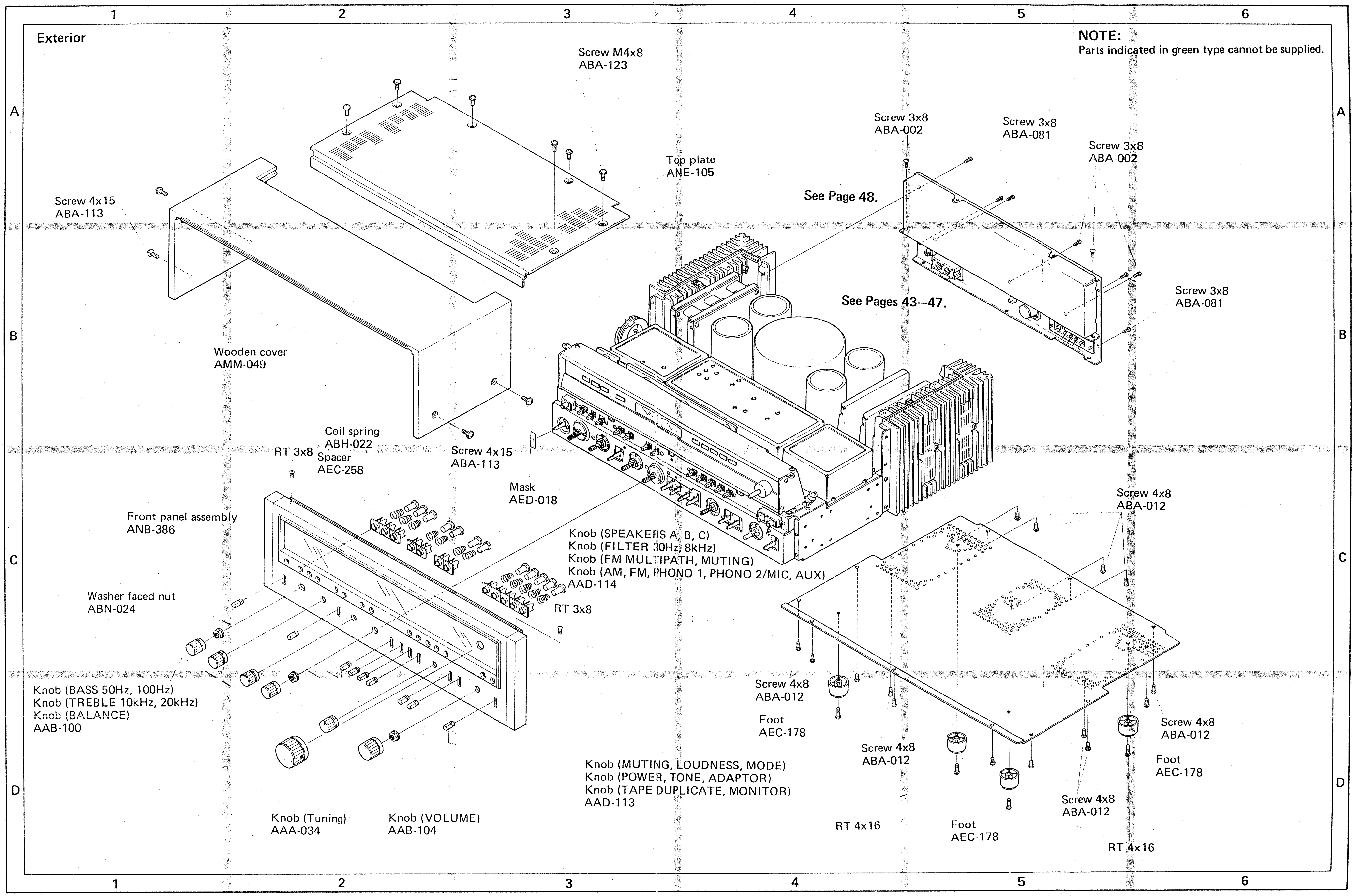


FW 9ϕx1^t
thickness in mm (*t*)
diameter in mm (*d*)
Symbol



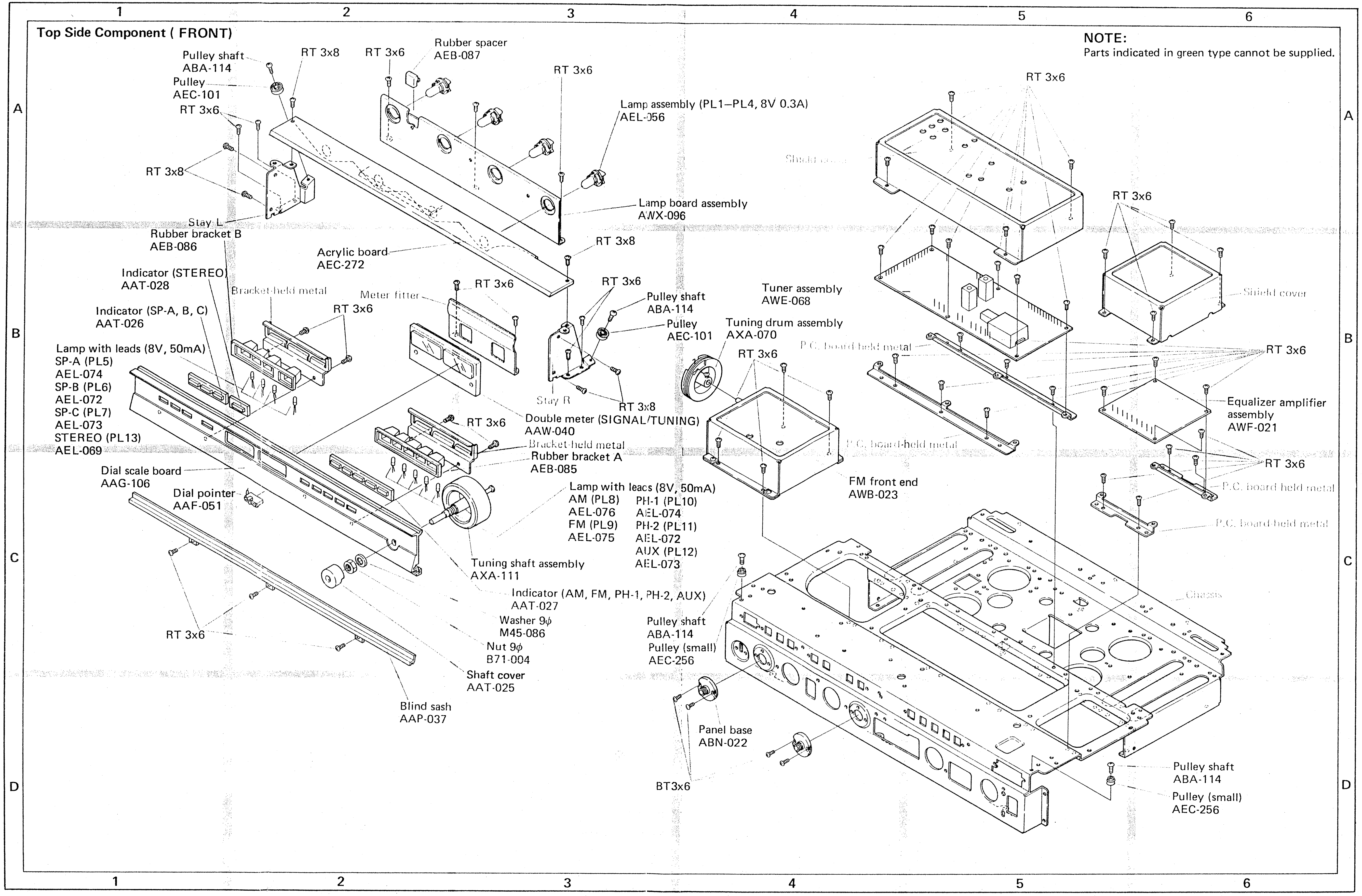
Exterior

NOTE:
Parts indicated in green type cannot be supplied.


1
2
3
4
5
6
A
B
C
D
Screw M4x8
ABA-123
Top plate
ANE-105
Screw 4x15
ABA-113
Wooden cover
AMM-049
See Page 48.
See Pages 43–47.
Screw 3x8
ABA-002
Screw 3x8
ABA-081
Screw 3x8
ABA-002
Screw 3x8
ABA-081
Coil spring
ABH-022
RT 3x8
Spacer
AEC-258
Screw 4x15
ABA-113
Mask
AED-018
Front panel assembly
ANB-386
Knob (SPEAKERS A, B, C)
Knob (FILTER 30Hz, 8kHz)
Knob (FM MULTIPATH, MUTING)
Knob (AM, FM, PHONO 1, PHONO 2/MIC, AUX)
AAD-114
RT 3x8
Washer faced nut
ABN-024
Screw 4x8
ABA-012
Knob (BASS 50Hz, 100Hz)
Knob (TREBLE 10kHz, 20kHz)
Knob (BALANCE)
AAB-100
Screw 4x8
ABA-012
Foot
AEC-178
Screw 4x8
ABA-012
Screw 4x8
ABA-012
Foot
AEC-178
Knob (MUTING, LOUDNESS, MODE)
Knob (POWER, TONE, ADAPTOR)
Knob (TAPE DUPLICATE, MONITOR)
AAD-113
Screw 4x8
ABA-012
Knob (Tuning)
AAA-034
Knob (VOLUME)
AAB-104
RT 4x16
Foot
AEC-178
RT 4x16

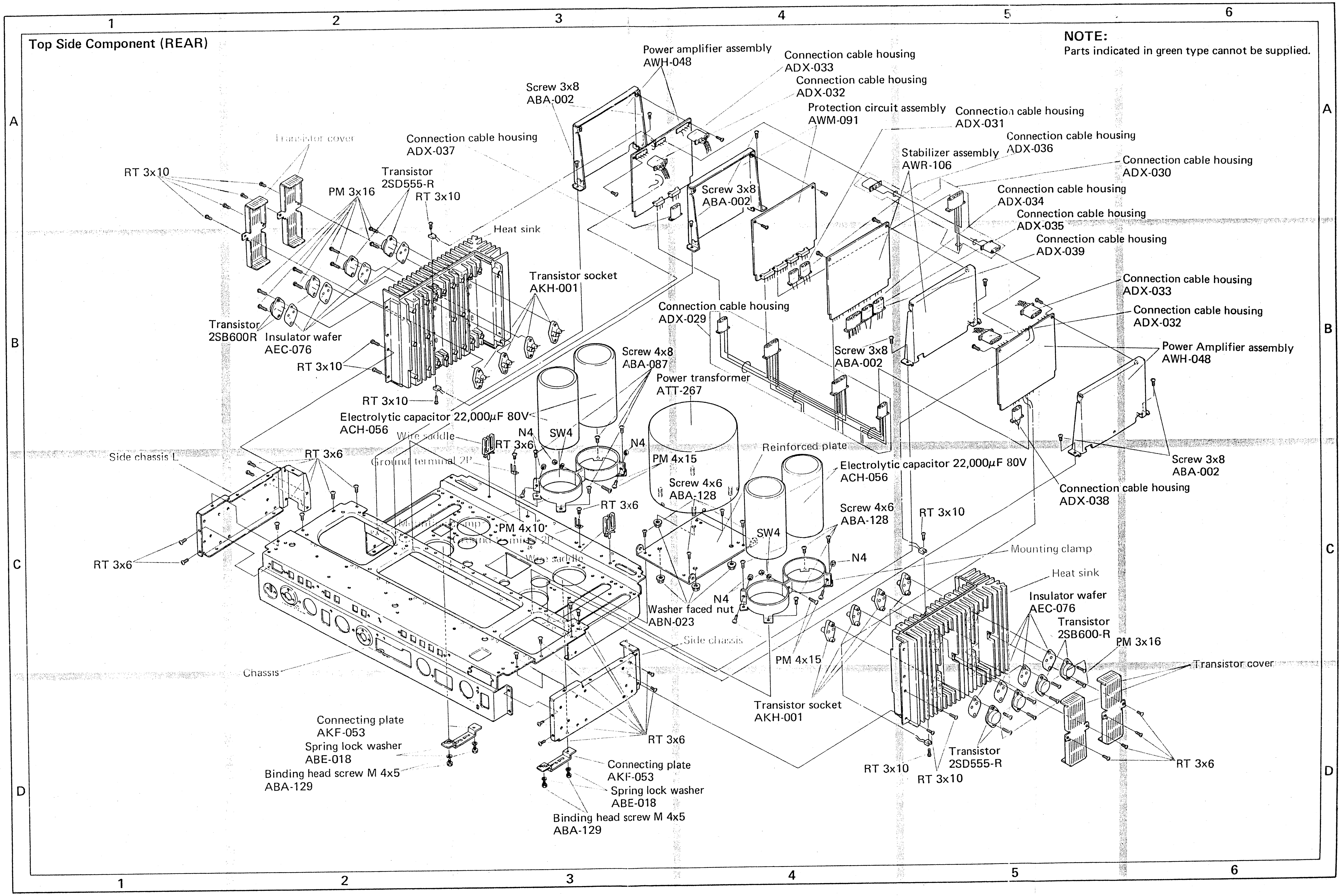
Top Side Component (FRONT)

NOTE:
Parts indicated in green type cannot be supplied.


1
2
3
4
5
6
A
B
C
D
Pulley shaft
ABA-114
Pulley
AEC-101
RT 3x6
RT 3x8
RT 3x8
RT 3x6
Rubber spacer
AEB-087
RT 3x6
Lamp assembly (PL1–PL4, 8V 0.3A)
AEL-056
Stay L
Rubber bracket B
AEB-086
Lamp board assembly
AWX-096
Acrylic board
AEC-272
RT 3x8
Indicator (STEREO)
AAT-028
Bracket-held metal
Meter fitter
RT 3x6
RT 3x6
RT 3x6
Pulley shaft
ABA-114
Pulley
AEC-101
Indicator (SP-A, B, C)
AAT-026
Lamp with leads (8V, 50mA)
SP-A (PL5)
AEL-074
SP-B (PL6)
AEL-072
SP-C (PL7)
AEL-073
STEREO (PL13)
AEL-069
Stay R
RT 3x8
RT 3x6
Double meter (SIGNAL/TUNING)
AAW-040
Bracket-held metal
Rubber bracket A
AEB-085
Dial scale board
AAG-106
Dial pointer
AAF-051
Lamp with leads (8V, 50mA)
AM (PL8)
AEL-076
FM (PL9)
AEL-075
PH-1 (PL10)
AEL-074
PH-2 (PL11)
AEL-072
AUX (PL12)
AEL-073
Tuning shaft assembly
AXA-111
Indicator (AM, FM, PH-1, PH-2, AUX)
AAT-027
Washer 9ϕ
M45-086
Nut 9ϕ
B71-004
Shaft cover
AAT-025
RT 3x6
Blind sash
AAP-037
Shield cover
Tuner assembly
AWE-068
Tuning drum assembly
AXA-070
RT 3x6
P.C. board held metal
P.C. board-held metal
FM front end
AWB-023
RT 3x6
RT 3x6
Shield cover
RT 3x6
Equalizer amplifier
assembly
AWF-021
RT 3x6
P.C. board held metal
P.C. board held metal
Chassis
Pulley shaft
ABA-114
Pulley (small)
AEC-256
Panel base
ABN-022
BT3x6
Pulley shaft
ABA-114
Pulley (small)
AEC-256

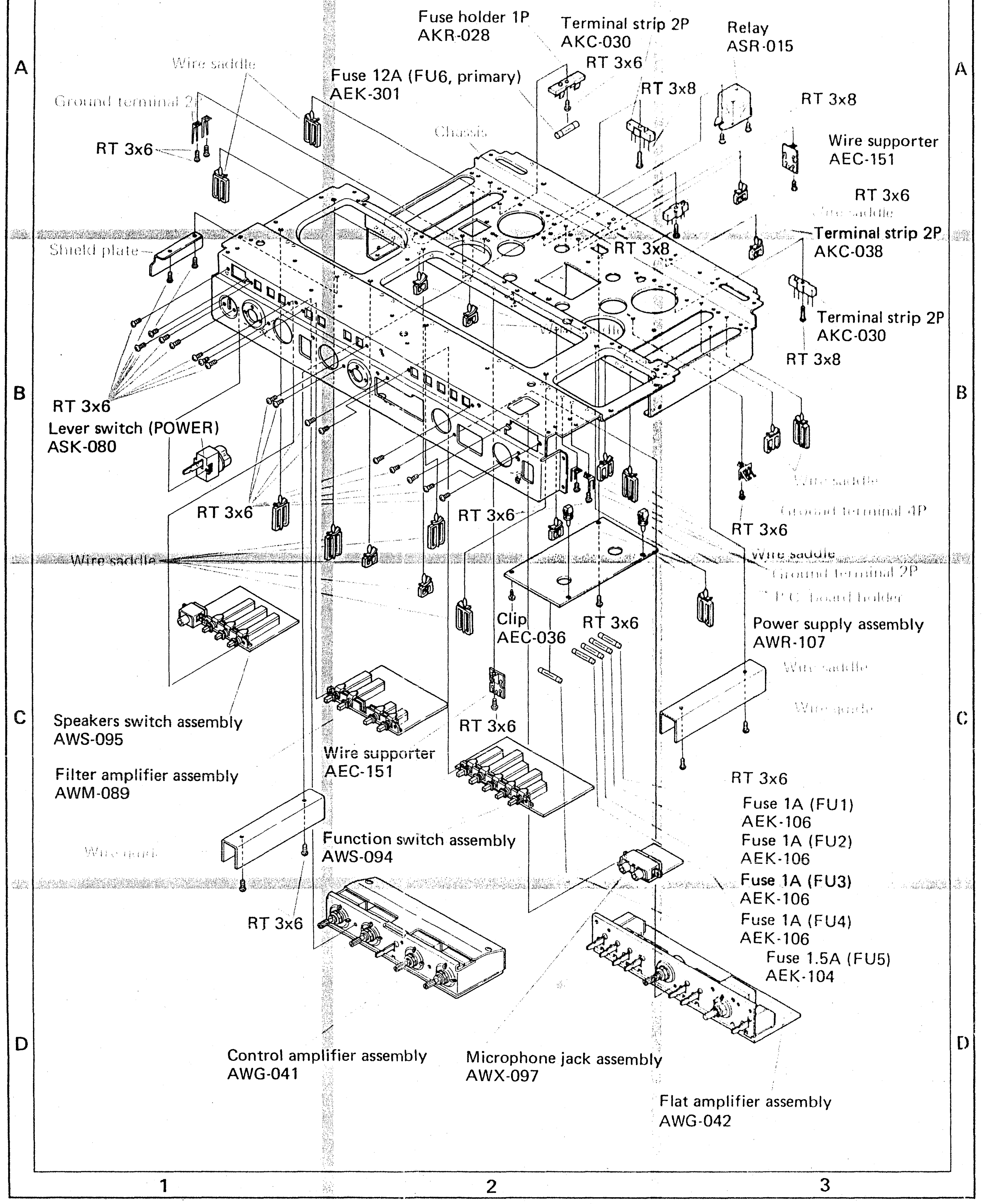
Top Side Component (REAR)

NOTE:
Parts indicated in green type cannot be supplied.


1
2
3
4
5
6
A
B
C
D
Power amplifier assembly
AWH-048
Connection cable housing
ADX-033
Connection cable housing
ADX-032
Protection circuit assembly
AWM-091
Connection cable housing
ADX-031
Connection cable housing
ADX-036
Stabilizer assembly
AWR-106
Connection cable housing
ADX-030
Connection cable housing
ADX-034
Connection cable housing
ADX-035
Connection cable housing
ADX-039
Screw 3x8
ABA-002
Transistor cover
Connection cable housing
ADX-037
RT 3x10
PM 3x16
Transistor
2SD555-R
RT 3x10
Screw 3x8
ABA-002
Heat sink
Transistor socket
AKH-001
Transistor
2SB600R
Insulator wafer
AEC-076
RT 3x10
Connection cable housing
ADX-029
Screw 4x8
ABA-087
Power transformer
ATT-267
Screw 3x8
ABA-002
Connection cable housing
ADX-033
Connection cable housing
ADX-032
Power Amplifier assembly
AWH-048
RT 3x10
Electrolytic capacitor 22,000μF 80V
ACH-056
Wire saddle
RT 3x6
N4
SW4
N4
Reinforced plate
Side chassis L
RT 3x6
Ground terminal 2P
PM 4x15
Screw 4x6
ABA-128
Electrolytic capacitor 22,000μF 80V
ACH-056
Screw 3x8
ABA-002
Connection cable housing
ADX-038
RT 3x6
Mounting clamp
PM 4x10
Ground terminal 2P
Wire saddle
Screw 4x6
ABA-128
RT 3x10
SW4
N4
N4
Mounting clamp
RT 3x6
Washer faced nut
ABN-023
Heat sink
Insulator wafer
AEC-076
Transistor
2SB600-R
PM 3x16
Side chassis
PM 4x15
Transistor cover
Chassis
Transistor socket
AKH-001
Connecting plate
AKF-053
Spring lock washer
ABE-018
Binding head screw M 4x5
ABA-129
RT 3x6
Connecting plate
AKF-053
Spring lock washer
ABE-018
Binding head screw M 4x5
ABA-129
RT 3x10
Transistor
2SD555-R
RT 3x10
RT 3x6
1
2
3
4
5
6

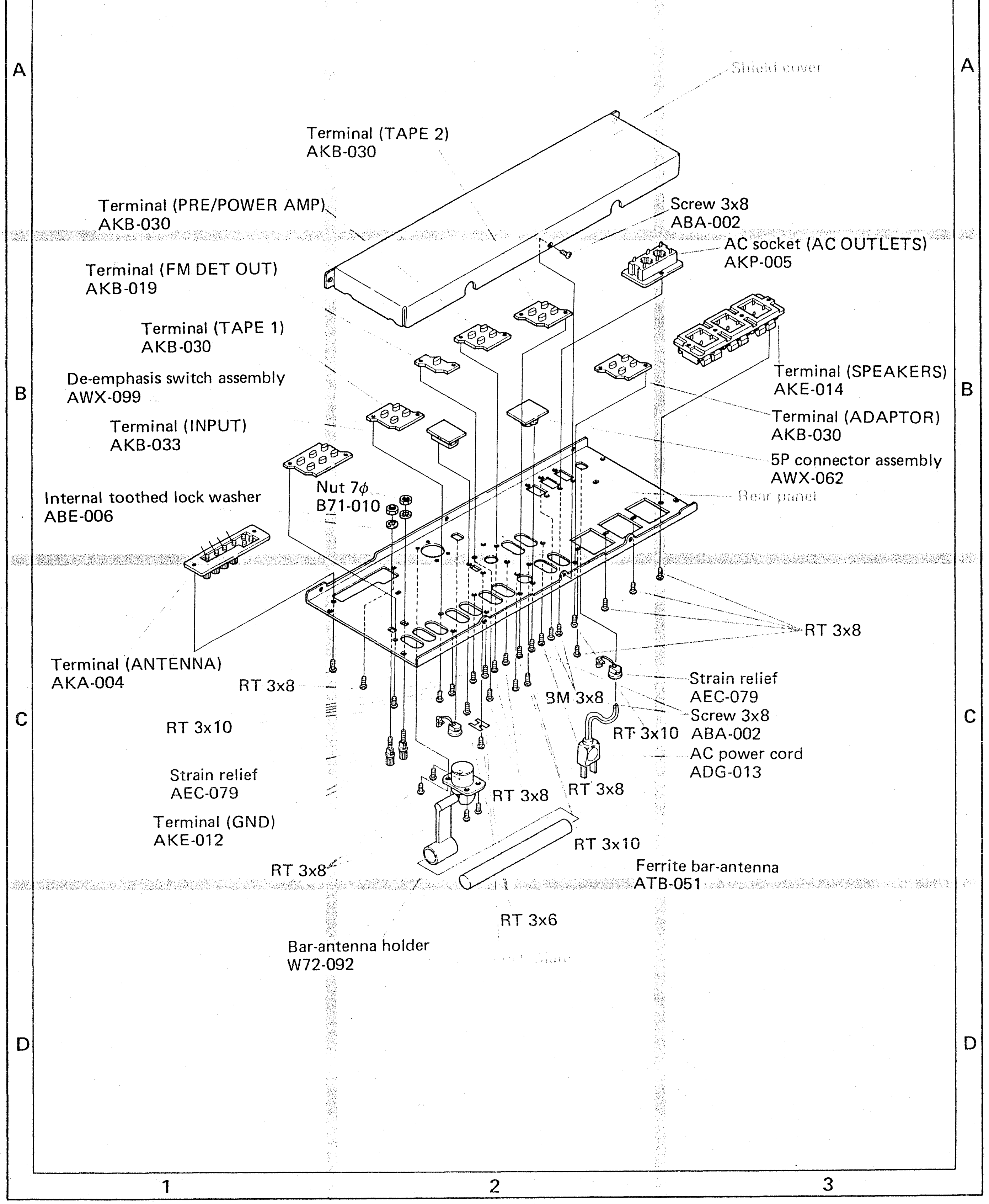
Bottom Side Components

NOTE:
Parts indicated in green type cannot be supplied.


1
2
3
A
B
C
D
Fuse holder 1P
AKR-028
Terminal strip 2P
AKC-030
Relay
ASR-015
Wire saddle
Fuse 12A (FU6, primary)
AEK-301
RT 3x6
RT 3x8
RT 3x8
Ground terminal 2P
RT 3x6
Chassis
Wire supporter
AEC-151
RT 3x6
Wire saddle
Terminal strip 2P
AKC-038
Shield plate
RT 3x8
Terminal strip 2P
AKC-030
RT 3x8
RT 3x6
Lever switch (POWER)
ASK-080
Wire saddle
Ground terminal 4P
RT 3x6
RT 3x6
RT 3x6
Wire saddle
Wire saddle
Ground terminal 2P
P.C. board holder
Clip
AEC-036
RT 3x6
Power supply assembly
AWR-107
Wire saddle
Wire saddle
Speakers switch assembly
AWS-095
RT 3x6
Wire supporter
AEC-151
Filter amplifier assembly
AWM-089
RT 3x6
Fuse 1A (FU1)
AEK-106
Fuse 1A (FU2)
AEK-106
Function switch assembly
AWS-094
Wire saddle
Fuse 1A (FU3)
AEK-106
Fuse 1A (FU4)
AEK-106
RT 3x6
Fuse 1.5A (FU5)
AEK-104
Control amplifier assembly
AWG-041
Microphone jack assembly
AWX-097
Flat amplifier assembly
AWG-042

Rear Panel Component

NOTE:
Parts indicated in green type cannot be supplied.


1
2
3
A
B
C
D
Shield cover
Terminal (TAPE 2)
AKB-030
Terminal (PRE/POWER AMP)
AKB-030
Screw 3x8
ABA-002
AC socket (AC OUTLETS)
AKP-005
Terminal (FM DET OUT)
AKB-019
Terminal (TAPE 1)
AKB-030
Terminal (SPEAKERS)
AKE-014
De-emphasis switch assembly
AWX-099
Terminal (ADAPTOR)
AKB-030
Terminal (INPUT)
AKB-033
5P connector assembly
AWX-062
Rear panel
Nut 7ϕ
B71-010
Internal toothed lock washer
ABE-006
RT 3x8
Terminal (ANTENNA)
AKA-004
RT 3x8
Strain relief
AEC-079
BM 3x8
Screw 3x8
RT 3x10
RT 3x10
ABA-002
AC power cord
ADG-013
Strain relief
AEC-079
RT 3x8
RT 3x8
Terminal (GND)
AKE-012
RT 3x10
RT 3x8
Ferrite bar-antenna
ATB-051
RT 3x6
Bar-antenna holder
W72-092

12. SCHEMATIC DIAGRAMS, P.C. BOARD PATTERNS AND PARTS LISTS

12.1 MISCELLANEOUS-PARTS

NOTE:

- *Capacitors: in μF unless otherwise noted p:pF*
- *Resistors: in Ω, ¼W unless otherwise noted k:kΩ, M:MΩ*

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SB600-R
Q2	Transistor	2SB600-R
Q3	Transistor	2SD555-R
Q4	Transistor	2SD555-R
Q5	Transistor	2SB600-R
Q6	Transistor	2SB600-R
Q7	Transistor	2SD555-R
Q8	Transistor	2SD555-R

SWITCHES

Symbol	Description	Part No.
S1	Lever switch (POWER)	ASK-080
S2	Relay	ASR-015

LAMPS

Symbol	Description	Part No.
PL1	Lamp assembly (8V, 0.3A)	AEL-056
PL2	Lamp assembly (8V, 0.3A)	AEL-056
PL3	Lamp assembly (8V, 0.3A)	AEL-056
PL4	Lamp assembly (8V, 0.3A)	AEL-056
PL5	Lamp with leads (8V, 50mA, SP-A)	AEL-074
PL6	Lamp with leads (8V, 50mA, SP-B)	AEL-072
PL7	Lamp with leads (8V, 50mA, SP-C)	AEL-073
PL8	Lamp with leads (8V, 50mA, AM)	AEL-076
PL9	Lamp with leads (8V, 50mA, FM)	AEL-075
PL10	Lamp with leads (8V, 50mA, PH-1)	AEL-074
PL11	Lamp with leads (8V, 50mA, PH-2)	AEL-072
PL12	Lamp with leads (8V, 50mA, AUX)	AEL-073
PL13	Lamp with leads (8V, 50mA, STEREO)	AEL-069

FUSES

Symbol	Description	Part No.
FU1	Fuse 1A	AEK-106
FU2	Fuse 1A	AEK-106
FU3	Fuse 1A	AEK-106
FU4	Fuse 1A	AEK-106
FU5	Fuse 1.5A	AEK-104
FU6	Fuse 12A (primary)	AEK-301

COILS AND TRANSFORMER

Symbol	Description	Part No.
T1	Ferrite balun	T22-025
T2	Ferrite bar-antenna	ATB-051
T3	Power transformer	ATT-267

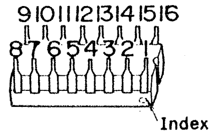
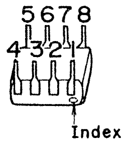
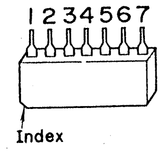
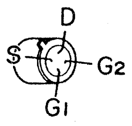
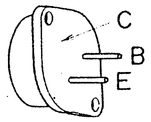
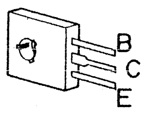
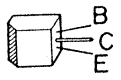
RESISTOR

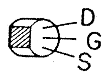
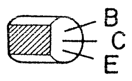
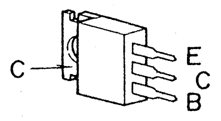
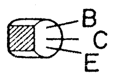
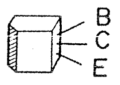
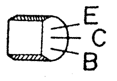
Symbol	Description	Part No.
R1	Carbon film 2.2M ½W	RD½PS 225J

CAPACITORS

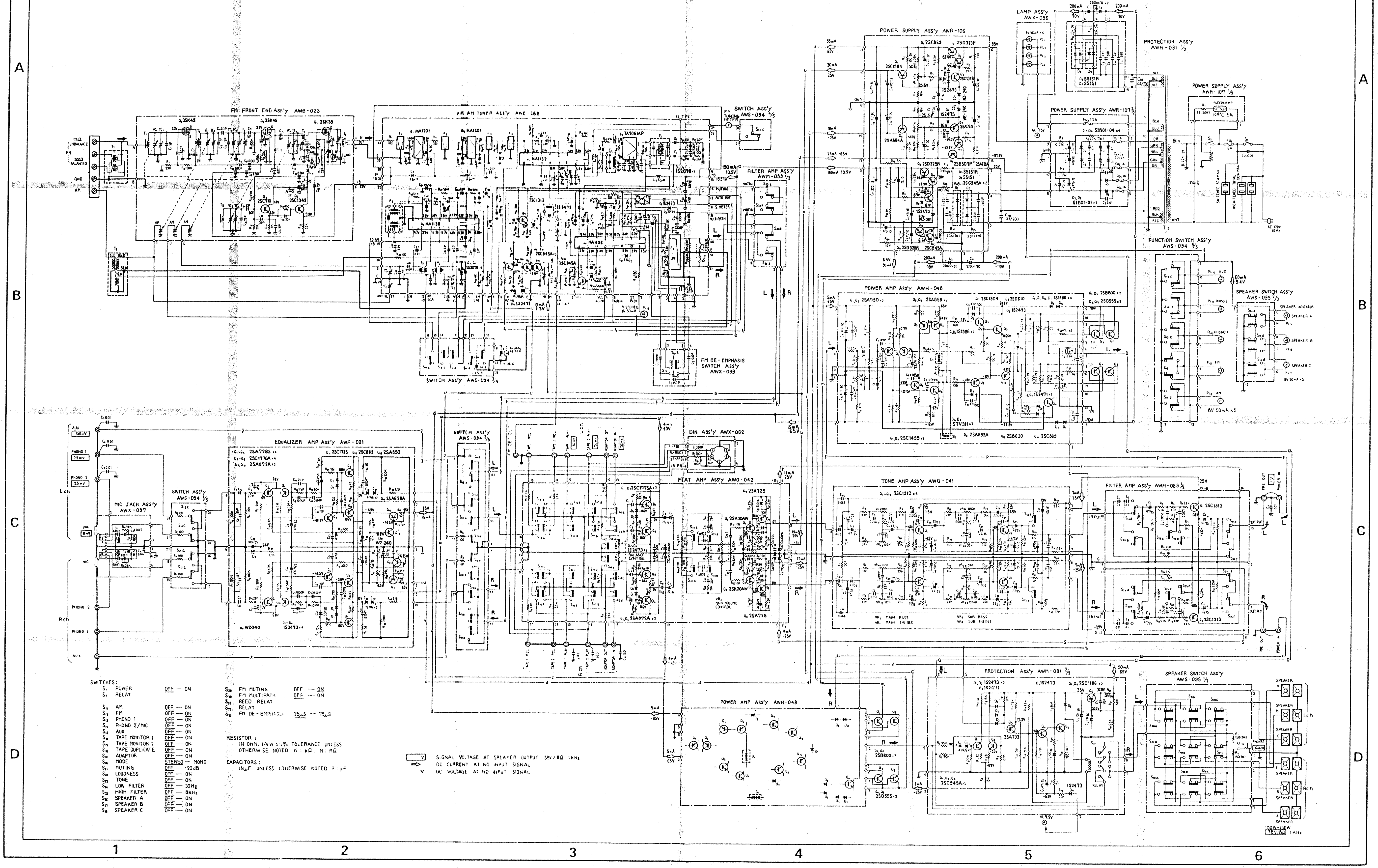
Symbol	Description	Part No.
C1	Electrolytic 22,000 80V	ACH-056
C2	Electrolytic 22,000 80V	ACH-056
C3	Electrolytic 22,000 80V	ACH-056
C4	Electrolytic 22,000 80V	ACH-056
C5	Ceramic 0.01 50V	CKDYF 103Z 50
C6	Ceramic 0.01 50V	CKDYF 103Z 50
C7	Ceramic 0.01 50V	CKDYF 103Z 50
C8	Ceramic 0.01 50V	CKDYF 103Z 50
C9	Ceramic 0.01 50V	CKDYF 103Z 50
C10	Ceramic 0.01 50V	CKDYF 103Z 50
C11	Ceramic 0.01 50V	CKDYF 103Z 50
C12	Ceramic 0.01 150V (DC1.4kV)	ACG-003
C13	Ceramic 0.01 150V (DC1.4kV)	ACG-003
C14	Electrolytic 100 6V	CEA 101P 6
C18	Mylar 0.1 200V	CQMA 104K 200
C19	Mylar 0.1 200V	CQMA 104K 200

External Appearance of Transistors and ICs

HA1137 HA1138 HA1196	
HA1201	
TA7061AP	
3SK39 3SK45	
2SB600 2SD555	
2SA899A 2SC1904	
2SC1166	

2SK30AW	
2SA684A 2SC1384	
2SB507P 2SB630 2SD313P 2SD325R 2SD610	
2SA628 2SA720 2SA733 2SA750 2SA858 2SA872A 2SC945A 2SC1318 2SC1439 2SC1775A	
2SC1342	
2SA725 2SA726 2SA850 2SC710 2SC869 2SC1312 2SC1313 2SC1735	

12.2 SCHEMATIC DIAGRAM


1
2
3
4
5
6
A
B
C
D
FM FRONT END ASS'Y AWE-023
FM AM TUNER ASS'Y AWE-068
SWITCH ASS'Y AWS-094 ⅘
FILTER AMP ASS'Y AWM-083 ½
SWITCH ASS'Y AWS-094 ⅗
FM DE-EMPHASIS SWITCH ASS'Y AWX-099
POWER SUPPLY ASS'Y AWR-106
LAMP ASS'Y AWX-096
PROTECTION ASS'Y AWM-091 ½
POWER SUPPLY ASS'Y AWR-107 ½
POWER SUPPLY ASS'Y AWR-107 ⅔
FUNCTION SWITCH ASS'Y AWS-094 ⅗
POWER AMP ASS'Y AWH-048
SPEAKER SWITCH ASS'Y AWS-095 ½
MIC JACK ASS'Y AWX-097
SWITCH ASS'Y AWS-094 ⅕
EQUALIZER AMP ASS'Y AWF-021
SWITCH ASS'Y AWS-094 ⅖
DIN ASS'Y AWX-062
FLAT AMP ASS'Y AWG-042
TONE AMP ASS'Y AWG-041
FILTER AMP ASS'Y AWM-083 ½
PROTECTION ASS'Y AWM-091 ⅔
POWER AMP ASS'Y AWH-048
SPEAKER SWITCH ASS'Y AWS-095 ½
AUX
PHONO 1
PHONO 2
MIC
Lch
Rch
SPEAKER
AC 120V 60Hz

SWITCHES;

S_1	POWER	OFF — ON
S_2	RELAY	
S_{11}	AM	OFF — ON
S_{12}	FM	OFF — ON
S_{13}	PHONO 1	OFF — ON
S_{14}	PHONO 2/MIC	OFF — ON
S_{15}	AUX	OFF — ON
S_{16}	TAPE MONITOR 1	OFF — ON
S_{17}	TAPE MONITOR 2	OFF — ON
S_{18}	TAPE DUPLICATE	OFF — ON
S_{19}	ADAPTOR	OFF — ON
S_{20}	MODE	STEREO — MONO
S_{21}	MUTING	OFF — -20dB
S_{22}	LOUDNESS	OFF — ON
S_{23}	TONE	OFF — ON
S_{24}	LOW FILTER	OFF — 30Hz
S_{25}	HIGH FILTER	OFF — 8kHz
S_{26}	SPEAKER A	OFF — ON
S_{27}	SPEAKER B	OFF — ON
S_{28}	SPEAKER C	OFF — ON
S_{29}	FM MUTING	OFF — ON
S_{30}	FM MULTIPATH	OFF — ON
S_{31}	REED RELAY	
S_{32}	RELAY	
S_{33}	FM DE-EMPHASIS	25μS — 75μS

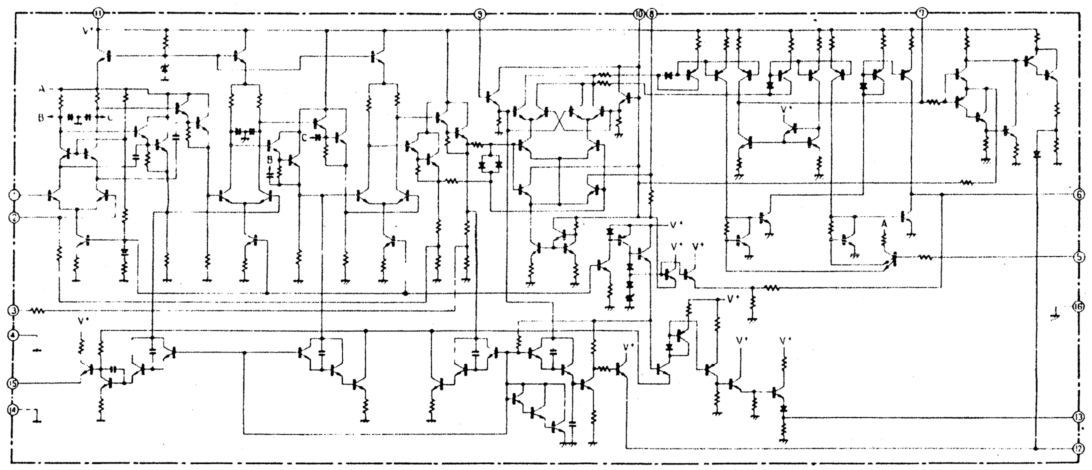
RESISTOR ;
IN OHM, 1/4W ±5% TOLERANCE UNLESS
OTHERWISE NOTED K : kΩ, M : MΩ

CAPACITORS ;
IN μF UNLESS OTHERWISE NOTED P : pF

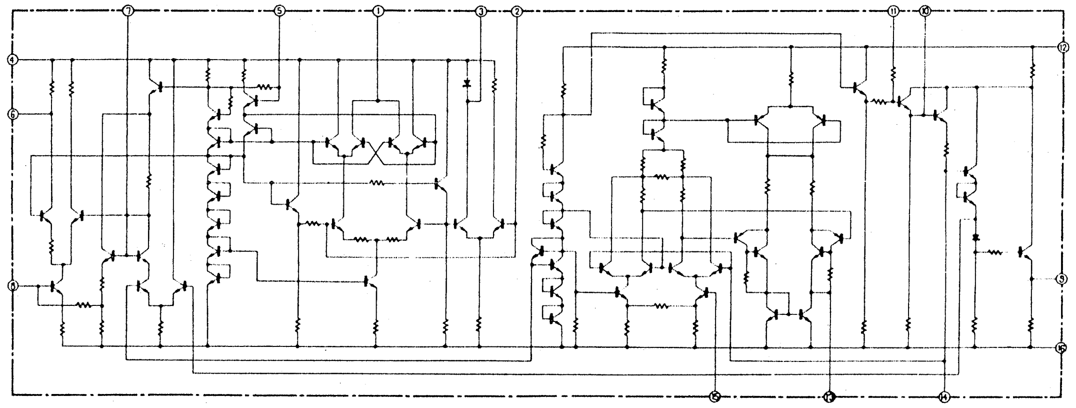
$\boxed{\quad V}$	SIGNAL VOLTAGE AT SPEAKER OUTPUT 38V/8Ω 1kHz
⇨	DC CURRENT AT NO INPUT SIGNAL
V	DC VOLTAGE AT NO INPUT SIGNAL

12.3 INTERNAL CIRCUITRY OF INTEGRATED CIRCUITS

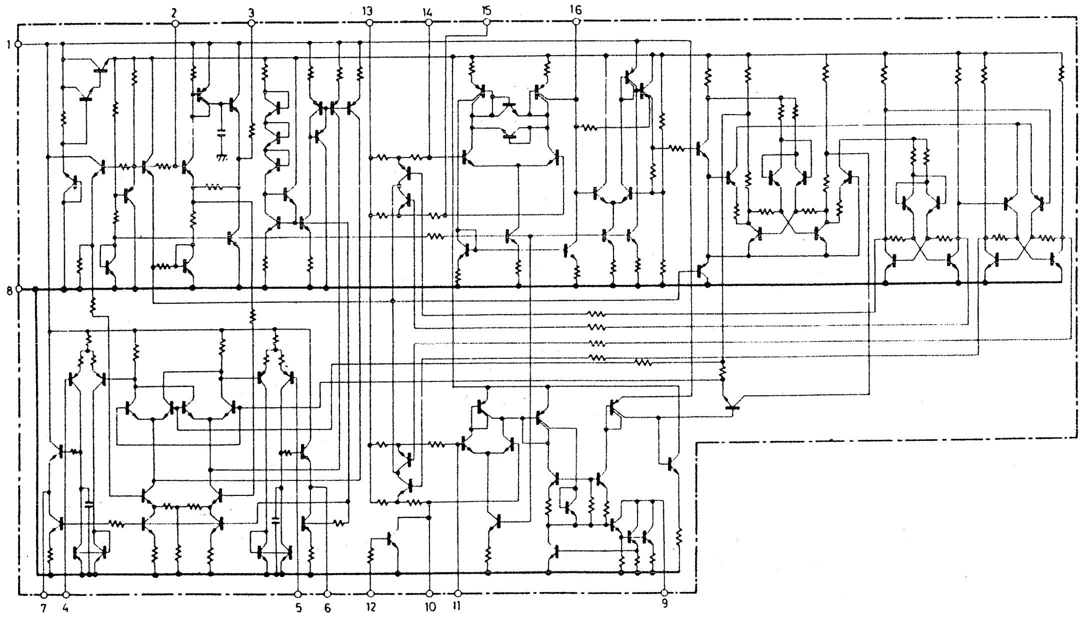
HA1137 (FM IF IC)



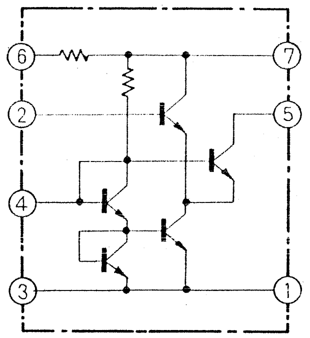
HA1138 (AM IC)



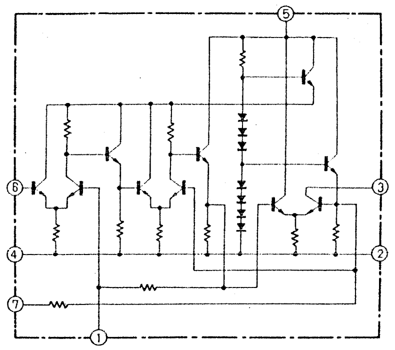
HA1196


1
2
3
13
14
15
16
8
7
4
5
6
12
10
11
9

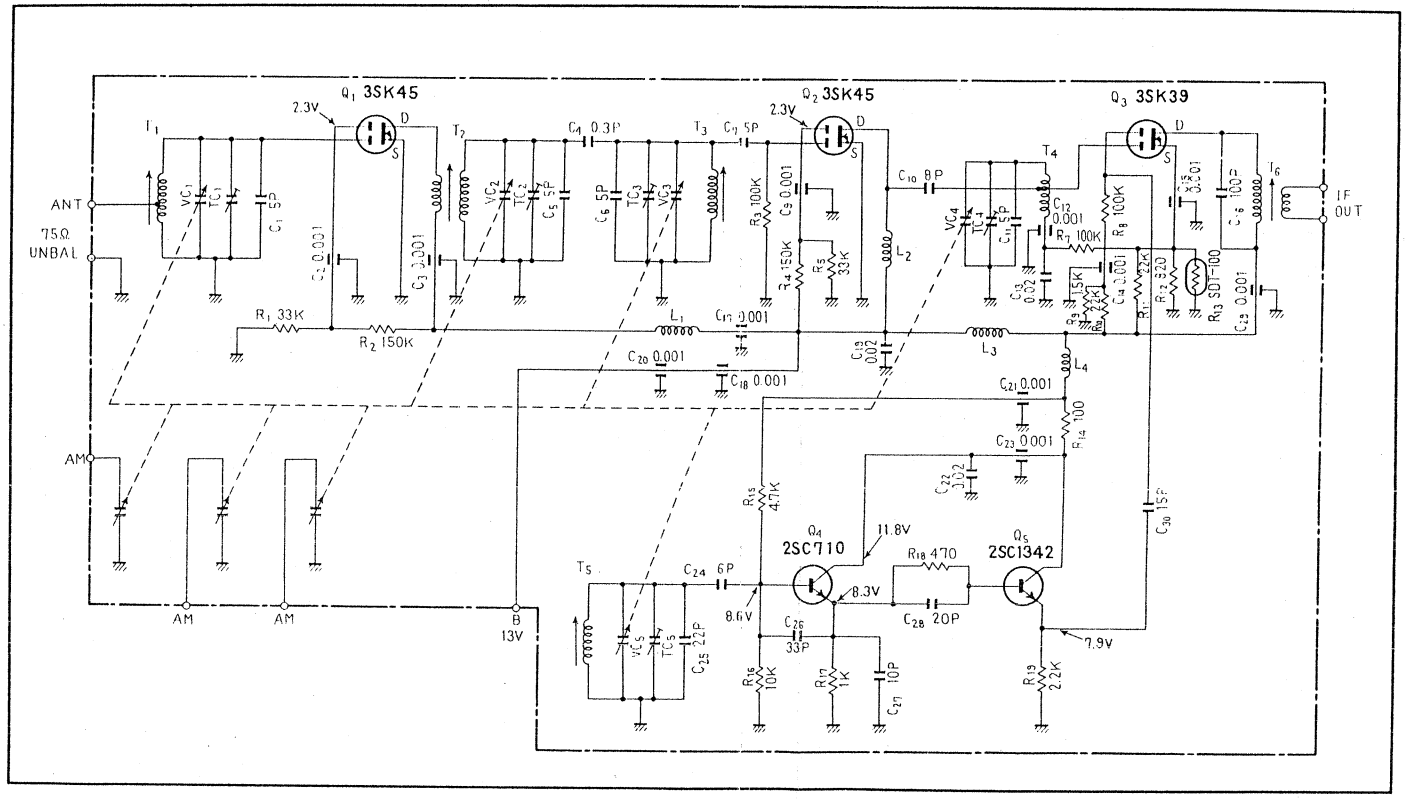
HA1201



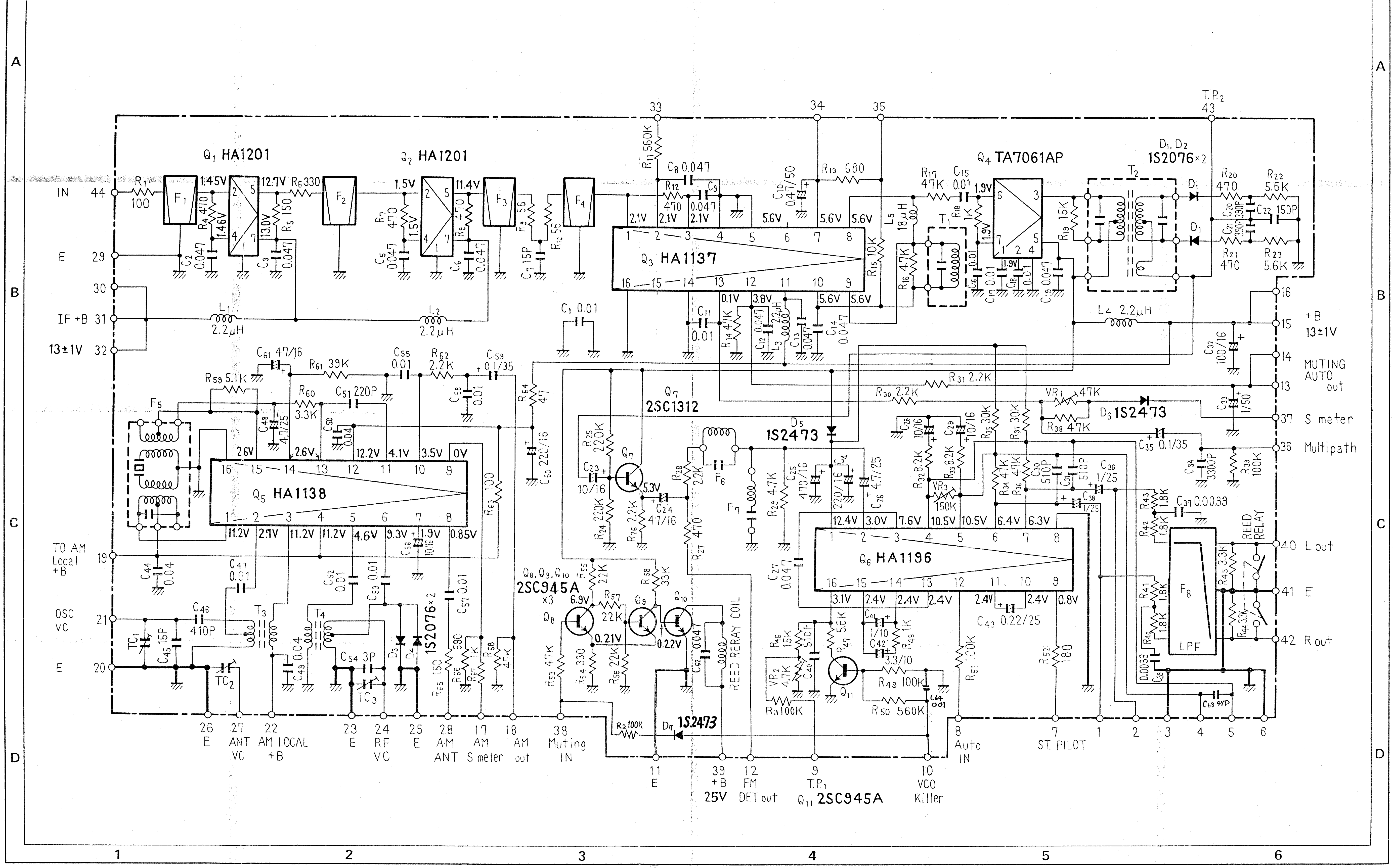
TA7061AP



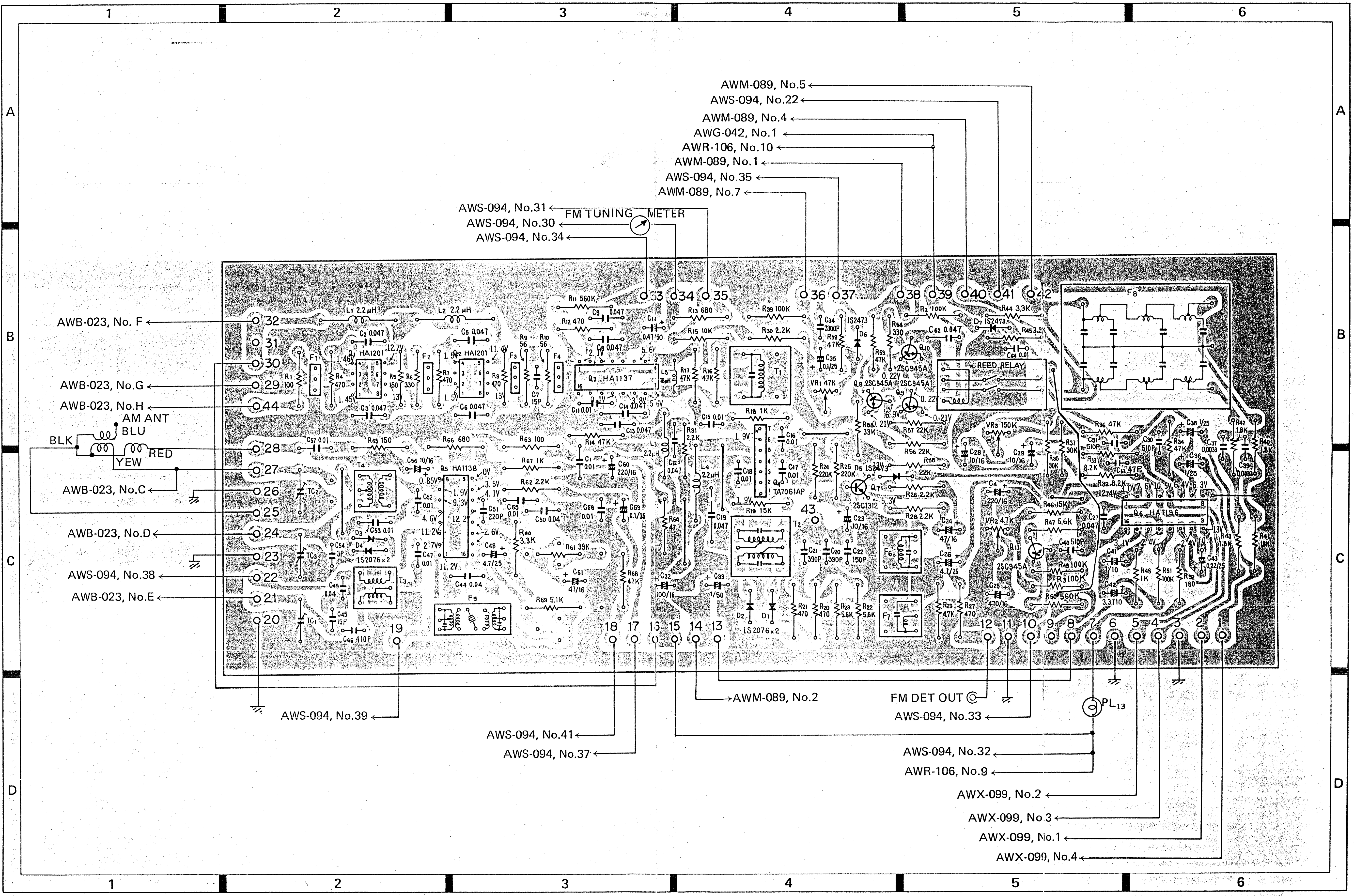
12.4 THE CIRCUIT OF FM FRONT END (AWB-023)


Q1 3SK45
2.3V
D
S
Q2 3SK45
2.3V
Q3 3SK39
T1
T2
T3
T4
T5
T6
ANT
75Ω
UNBAL
VC1
TC1
C1 5P
C2 0.001
C3 0.001
VC2
TC2
C5 5P
C4 0.3P
C6 5P
TC3
VC3
C7 5P
R3 100K
C9 0.001
R4 150K
R5 33K
L2
C10 8P
VC4
TC4
C11 5P
C12 0.001
R7 100K
R8 100K
C13 0.02
R9 1.5K
R10 22K
C14 0.001
R11 22K
R12 820
R13 SDT-100
C15 0.001
C16 100P
C29 0.001
IF
OUT
R1 33K
R2 150K
L1
C17 0.001
C20 0.001
C18 0.001
C19 0.02
L3
L4
C21 0.001
R14 100
C23 0.001
C22 0.02
R15 4.7K
C30 15P
AM
AM
AM
B
13V
Q4
2SC710
11.8V
R18 470
Q5
2SC1342
C24 6P
8.3V
8.6V
C26 33P
C28 20P
7.9V
VC5
TC5
C25 22P
R16 10K
R17 1K
C27 10P
R19 2.2K

12.5 TUNER ASSEMBLY (AWE-068)



Q1 HA1201
Q2 HA1201
Q3 HA1137
Q4 TA7061AP
Q5 HA1138
Q6 HA1196
Q7 2SC1312
Q8, Q9, Q10 2SC945A ×3
Q11 2SC945A
D1, D2 1S2076×2
D3 D4 1S2076×2
D5 1S2473
D6 1S2473
D7 1S2473
F1 F2 F3 F4 F5 F6 F7 F8
LPF
T1 T2 T3 T4
L1 2.2μH
L2 2.2μH
L4 2.2μH
L5 18μH
VR1 47K
VR2 47K
VR3 150K
REED RELAY
REED RERAY COIL
IN 44
E 29
30
IF +B 31
13±1V 32
TO AM Local +B 19
OSC VC 21
E 20
26 E
27 ANT VC
22 AM LOCAL +B
23 E
24 RF VC
25 E
28 AM ANT
17 AM S meter
18 AM out
38 Muting IN
11 E
39 +B 25V
12 FM DET out
9 T.P.1
10 VCO Killer
8 Auto IN
7 ST. PILOT
1 2 3 4 5 6
33 34 35
T.P.2 43
16
15 +B 13±1V
14 MUTING AUTO out
13
37 S meter
36 Multipath
40 L out
41 E
42 R out
A B C D
1 2 3 4 5 6


1
2
3
4
5
6
A
B
C
D
AWM-089, No.5
AWS-094, No.22
AWM-089, No.4
AWG-042, No.1
AWR-106, No.10
AWM-089, No.1
AWS-094, No.35
AWM-089, No.7
AWS-094, No.31
AWS-094, No.30
AWS-094, No.34
FM TUNING METER
AWB-023, No. F
AWB-023, No.G
AWB-023, No.H
AM ANT
BLU
BLK
RED
YEW
AWB-023, No.C
AWB-023, No.D
AWS-094, No.38
AWB-023, No.E
AWS-094, No.39
AWS-094, No.41
AWS-094, No.37
AWM-089, No.2
FM DET OUT
AWS-094, No.33
PL13
AWS-094, No.32
AWR-106, No.9
AWX-099, No.2
AWX-099, No.3
AWX-099, No.1
AWX-099, No.4
HA1201
HA1137
HA1138
TA7061AP
HA1196
REED RELAY
2SC945A
2SC1312
1S2473
1S2076×2
F1
F2
F3
F4
F5
F6
F7
F8
T1
T2
T3
T4
VR1 47K
VR2 4.7K
VR3 150K
L1 2.2μH
L2 2.2μH
L4 2.2μH
R11 560K
R13 680
R39 100K
R2 100K
R44 3.3K
R65 150
R66 680
R63 100
R69 5.1K

Parts List of Tuner Assembly (AWE-068)

SEMICONDUCTOR

Symbol	Description	Part No.
Q1	IC	HA1201
Q2	IC	HA1201
Q3	IC	HA1137
Q4	IC	TA7061AP
Q5	IC	HA1138
Q6	IC	HA1196
Q7	Transistor	2SC1312-G
Q8	Transistor	2SC945A-Q
Q9	Transistor	2SC945A-Q
Q10	Transistor	2SC945A-Q
Q11	Transistor	2SC945A-Q
D1	Diode	1S2076
D2	Diode	1S2076
D3	Diode	1S2076
D4	Diode	1S2076
D5	Diode	1S2473
D6	Diode	1S2473
D7	Diode	1S2473

TRANSFORMERS AND COILS

Symbol	Description	Part No.
T1	FM IF transformer	ATE-029
T2	FM DET transformer	ATE-013
T3	AM oscillator coil	ATB-019
T4	AF RF coil	ATB-020
F1	FM ceramic filter	ATF-018
F2	FM ceramic filter	ATF-018
F3	FM ceramic filter	ATF-018
F4	FM ceramic filter	ATF-018
F5	AM ceramic filter	ATF-027
F6	Anti-birby filter	ATF-023
F7	Anti-birby filter	ATF-024
F8	FM lowpass filter	ATF-028
L1	RF choke coil 2.2μH	T24-028
L2	RF choke coil 2.2μH	T24-028
L3	RF choke coil 2.2μH	T24-028
L4	RF choke coil 2.2μH	T24-028
L5	RF choke coil 18μH	ATH-007

RESISTORS

Symbol	Description	Part No.
R1	Carbon film 100	RD¼PS 101J
R2	Carbon film 100k	RD¼PS 104J
R3	Carbon film 100k	RD¼PS 104J
R4	Carbon film 470	RD¼PS 471J
R5	Carbon film 150	RD¼PS 151J
R6	Carbon film 330	RD¼PS 331J
R7	Carbon film 470	RD¼PS 471J
R8	Carbon film 470	RD¼PS 471J
R9	Carbon film 56	RD¼PS 560J
R10	Carbon film 56	RD¼PS 560J
R11	Carbon film 560k	RD¼PS 564J
R12	Carbon film 470	RD¼PS 471J
R13	Carbon film 680	RD¼PS 681J
R14	Carbon film 47k	RD¼PS 473J
R15	Carbon film 10k	RD¼PS 103J
R16	Carbon film 4.7k	RD¼PS 472J
R17	Carbon film 47k	RD¼PS 473J
R18	Carbon film 1k	RD¼PS 102J
R19	Carbon film 15k	RD¼PS 153J
R20	Carbon film 470	RD¼PS 471J
R21	Carbon film 470	RD¼PS 471J
R22	Carbon film 5.6k	RD¼PS 562J
R23	Carbon film 5.6k	RD¼PS 562J
R24	Carbon film 220k	RD¼PS 224JNL
R25	Carbon film 220k	RD¼PS 224JNL
R26	Carbon film 2.2k	RD¼PS 222J
R27	Carbon film 470	RD¼PS 471J
R28	Carbon film 2.2k	RD¼PS 222J
R29	Carbon film 4.7k	RD¼PS 472J
R30	Carbon film 2.2k	RD¼PS 222J
R31	Carbon film 2.2k	RD¼PS 222J
R32	Carbon film 8.2k	RD¼PS 822J
R33	Carbon film 8.2k	RD¼PS 822J
R34	Carbon film 47k	RD¼PS 473J
R35	Carbon film 30k	RD¼PS 303J
R36	Carbon film 47k	RD¼PS 473J
R37	Carbon film 30k	RD¼PS 303J
R38	Carbon film 47k	RD¼PS 473J
R39	Carbon film 100k	RD¼PS 104J
R40	Carbon film 1.8k	RD¼PS 182J
R41	Carbon film 1.8k	RD¼PS 182J
R42	Carbon film 1.8k	RD¼PS 182J
R43	Carbon film 1.8k	RD¼PS 182J
R44	Carbon film 3.3k	RD¼PS 332J
R45	Carbon film 3.3k	RD¼PS 332J
R46	Carbon film 15k	RD¼PS 153J
R47	Carbon film 5.6k	RD¼PS 562J
R48	Carbon film 1k	RD¼PS 102J
R49	Carbon film 100k	RD¼PS 104J
R50	Carbon film 560k	RD¼PS 564J
R51	Carbon film 100k	RD¼PS 104J
R52	Carbon film 180	RD¼PS 181J
R53	Carbon film 47k	RD¼PS 473J
R54	Carbon film 330	RD¼PS 331J
R55	Carbon film 22k	RD¼PS 223J
R56	Carbon film 22k	RD¼PS 223J
R57	Carbon film 22k	RD¼PS 223J
R58	Carbon film 33k	RD¼PS 333J
R59	Carbon film 5.1k	RD¼PS 512J
R60	Carbon film 3.3k	RD¼PS 332J
R61	Carbon film 39k	RD¼PS 393J
R62	Carbon film 2.2k	RD¼PS 222J
R63	Carbon film 100	RD¼PS 101J
R64	Carbon film 47	RD¼PS 470J
R65	Carbon film 150	RD¼PS 151J
R66	Carbon film 680	RD¼PS 681J
R67	Carbon film 1k	RD¼PS 102J
R68	Carbon film 47k	RD¼PS 473J
VR1	Semi-fixed 47k-B	C92-048
VR2	Semi-fixed 4.7k-B	ACP-018
VR3	Semi-fixed 150k-B	ACP-014

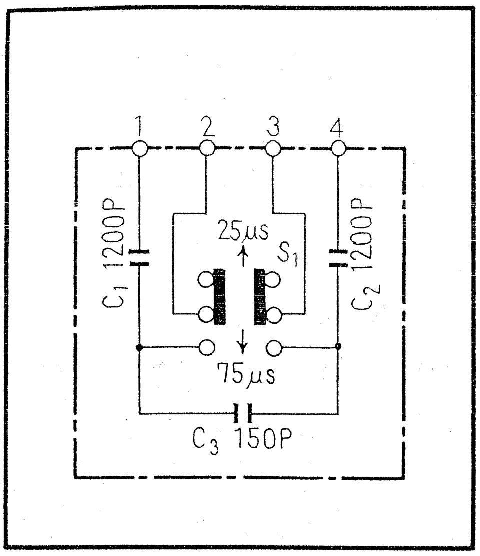
CAPACITORS

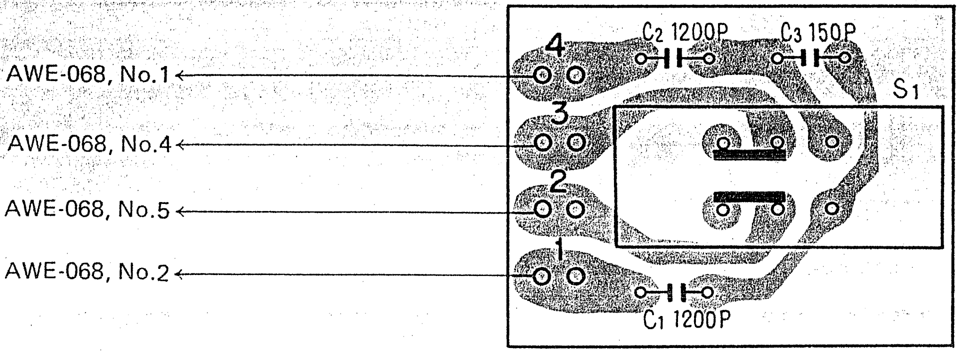
Symbol	Description	Part No.
TC1	Film trimmer	ACM-002
TC2	Film trimmer	ACM-002
TC3	Film trimmer	ACM-002
C1	Ceramic 0.01 50V	CKDYF 103Z 50
C2	Ceramic 0.047 25V	CKDBC 473Z 25
C3	Ceramic 0.047 25V	CKDBC 473Z 25
C4	Electrolytic 220 16V	CEA 221P 16
C5	Ceramic 0.047 25V	CKDBC 473Z 25
C6	Ceramic 0.047 25V	CKDBC 473Z 25
C7	Ceramic 15p 50V	CCDSL 150K 50
C8	Ceramic 0.047 25V	CKDBC 473Z 25
C9	Ceramic 0.047 25V	CKDBC 473Z 25
C10	Electrolytic 0.47 50V	CEA R47P 50
C11	Ceramic 0.01 50V	CKDYF 103Z 50
C12	Ceramic 0.047 25V	CKDBC 473Z 25
C13	Ceramic 0.047 25V	CKDBC 473Z 25
C14	Ceramic 0.047 25V	CKDBC 473Z 25
C15	Ceramic 0.01 50V	CKDYF 103Z 50
C16	Ceramic 0.01 50V	CKDYF 103Z 50
C17	Ceramic 0.01 50V	CKDYF 103Z 50
C18	Ceramic 0.01 50V	CKDYF 103Z 50
C19	Ceramic 0.047 25V	CKDBC 473Z 25
C20	Ceramic 390p 50V	CCKSL 391K 50
C21	Ceramic 390p 50V	CCDSL 391K 50
C22	Ceramic 150p 50V	CCDSL 151K 50
C23	Electrolytic 10 16V	CSZA 100M 16
C24	Electrolytic 47 16V	CEANL 470P 16
C25	Electrolytic 470 16V	CEA 471P 16
C26	Electrolytic 4.7 25V	CEANL 4R7P 25
C27	Mylar 0.047 50V	CQMA 473J 50
C28	Electrolytic 10 16V	CEANL 100P 16
C29	Electrolytic 10 16V	CEANL 100P 16
C30	Polystyrene film 510p 50V	CQSA 511J 50
C31	Polystyrene film 510p 50V	CQSA 511J 50
C32	Electrolytic 100 16V	CEA 101P 16
C33	Electrolytic 1 50V	CEA 010P 50
C34	Ceramic 0.0033 50V	CKDYA 332J 50
C35	Electrolytic 0.1 35V	CSZA 0R1M 35
C36	Electrolytic 1 25V	CEANL 010P 25
C37	Mylar 0.0033 50V	CQMA 332J 50
C38	Electrolytic 1 25V	CEANL 010P 25
C39	Mylar 0.0033 50V	CQMA 332J 50
C40	Polystyrene film 510p 50V	CQSH 511J 50
C41	Electrolytic 1 10V	CSSA 010M 10
C42	Electrolytic 3.3 10V	CSSA 3R3M 10
C43	Electrolytic 0.22 25V	CSSA R22M 25
C44	Ceramic 0.04 50V	CKDYF 403Z 50
C45	Ceramic 15p 50V	CCDWK 150K 50
C46	Polystyrene film 410p 50V	CQSA 411J 50
C47	Ceramic 0.01 50V	CKDYA 103J 50
C48	Electrolytic 4.7 25V	CEA 4R7P 25
C49	Ceramic 0.04 50V	CKDYF 403Z 50
C50	Ceramic 0.04 50V	CKDYF 403Z 50
C51	Ceramic 220p 50V	CCDSL 221K 50
C52	Ceramic 0.01 50V	CKDYF 103Z 50
C53	Ceramic 0.01 50V	CKDYF 103Z 50
C54	Ceramic 3p 50V	CCDSH 030D 50
C55	Ceramic 0.01 50V	CKDYF 103Z 50
C56	Electrolytic 10 16V	CEA 100P 16
C57	Ceramic 0.01 50V	CKDYF 103Z 50
C58	Ceramic 0.01 50V	CKDYF 103Z 50
C59	Electrolytic 0.1 35V	CSZA 0R1M 35
C60	Electrolytic 220 16V	CEA 221P 16
C61	Electrolytic 47 16V	CEA 470P 16
C62	Ceramic 0.047 25V	CKDBC 473Z 25
C63	Ceramic 47p 50V	CCDSL 470K 50
C64	Ceramic 0.01 50V	CKDYF 103Z 50

OTHER

Symbol	Description	Part No.
	Reed relay	ASR-005

12.6 DE-EMPHASIS SWITCH ASSEMBLY (AWX-099)


1
2
3
4
C1 1200P
C2 1200P
25μs
S1
75μs
C3 150P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AWE-068, No.4
AWE-068, No.5
AWE-068, No.2
4
3
2
1
C2 1200P
C3 150P
S1
C1 1200P

Parts List of De-emphasis Switch Assembly (AWX-099)

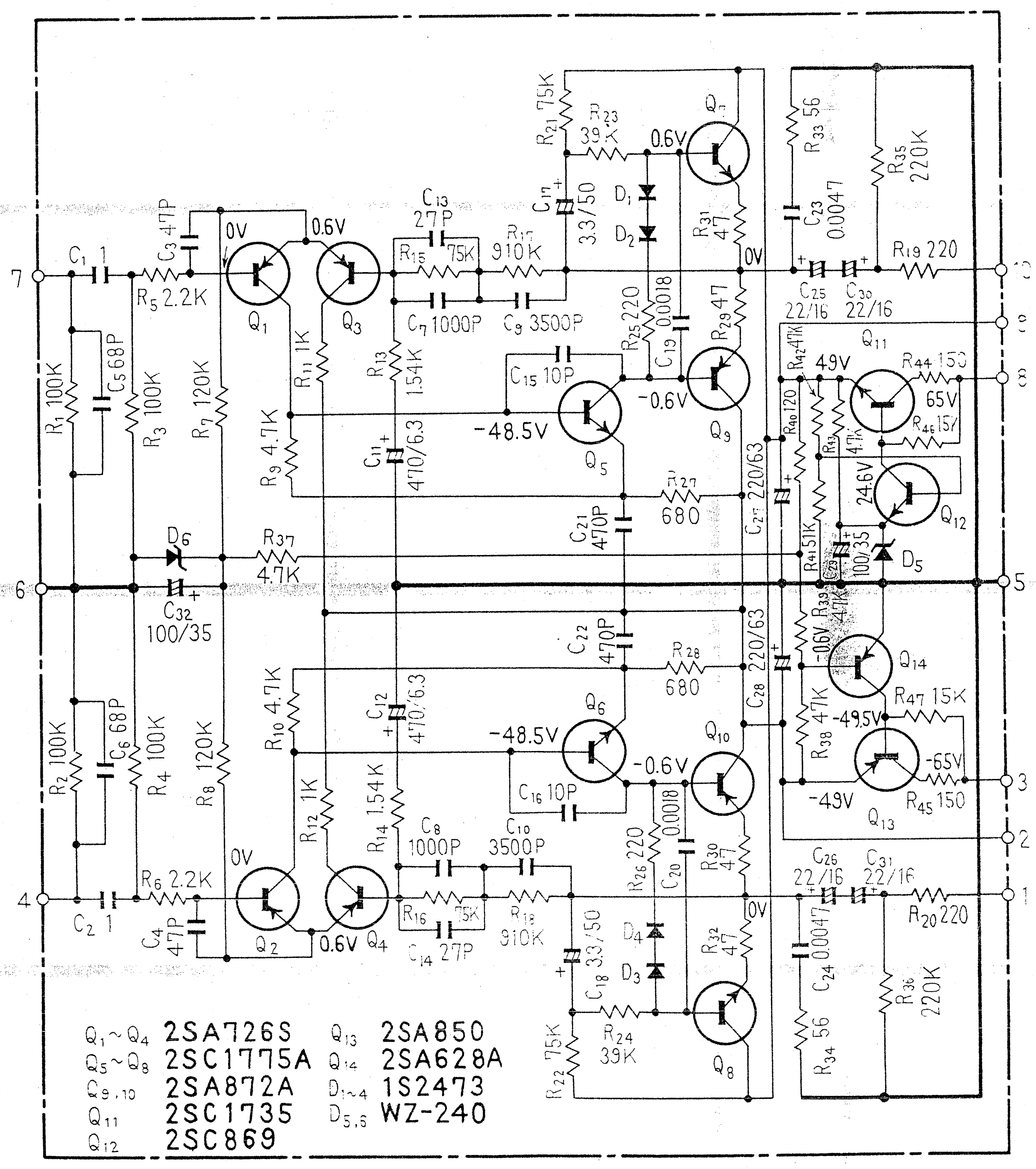
SWITCH

Symbol	Description	Part No.
S1	Slide switch (DE-EMPHASIS)	ASH-015-0

CAPACITORS

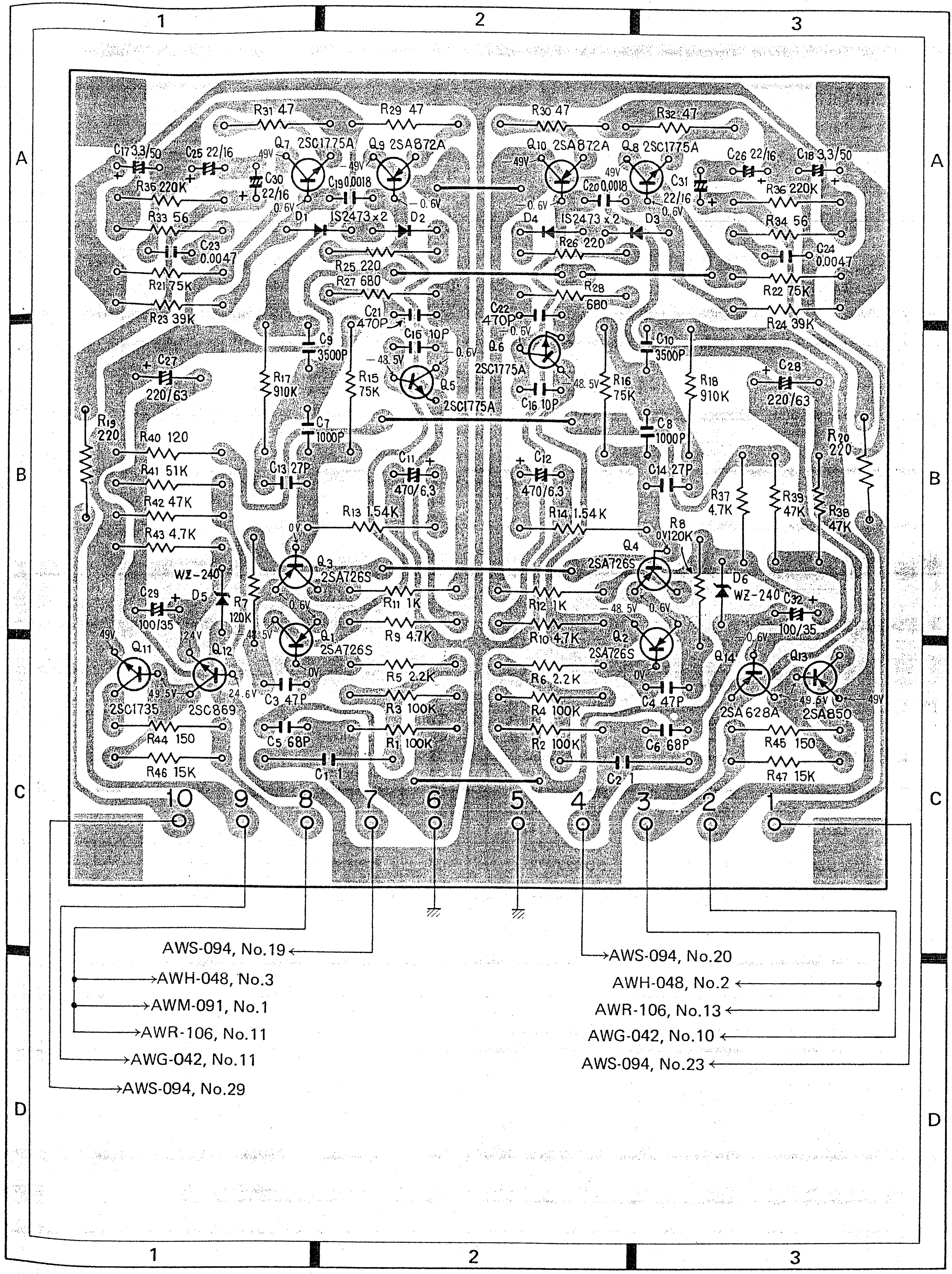
Symbol	Description			Part No.
C1	Mylar	1200p	50V	CQMA 122J 50
C2	Mylar	1200p	50V	CQMA 122J 50
C3	Ceramic	150p	50V	CCDSL 151K 50

12.7 EQUALIZER AMPLIFIER ASSEMBLY (AWF-021)



1
2
3
A
B
C
D
7
6
4
10
9
8
5
3
2
1
C1 1
C3 47P
R5 2.2K
0V
0.6V
Q1
Q3
C5 68P
R1 100K
R3 100K
R7 120K
R11 1K
R9 4.7K
C13 27P
R15 75K
R17 910K
C7 1000P
C9 3500P
R13 1.54K
C11 470/6.3
R21 75K
R23 39K
C17 3.3/50
D1
D2
Q7
R31 47
R25 220
C19 0.0018
R29 47
C15 10P
Q5
-48.5V
-0.6V
Q9
R27 680
C21 470P
C27 220/63
R33 56
R35 220K
C23 0.0047
C25 22/16
C30 22/16
R19 220
R42 47K
49V
Q11
R44 150
65V
R46 15K
R40 120
R43 47K
24.6V
Q12
R41 51K
C29 100/35
D5
D6
R37 4.7K
C32 100/35
R39 47K
-0.6V
Q14
R47 15K
-49.5V
R38 47K
-65V
R45 150
-49V
Q13
C2 1
C6 68P
R2 100K
R4 100K
R8 120K
R6 2.2K
C4 47P
Q2
Q4
R10 4.7K
R12 1K
R14 1.54K
C12 470/6.3
C8 1000P
C10 3500P
R16 75K
R18 910K
C14 27P
C18 3.3/50
R22 75K
R24 39K
Q6
C16 10P
C22 470P
R28 680
C28 220/63
Q10
R26 220
C20 0.0018
R30 47
D4
D3
R32 47
Q8
C26 22/16
C31 22/16
R20 220
C24 0.0047
R34 56
R36 220K

Q_1 ~ Q_4	2SA726S	Q_{13}	2SA850
Q_5 ~ Q_8	2SC1775A	Q_{14}	2SA628A
$Q_{9,10}$	2SA872A	D_1 ~ $_4$	1S2473
Q_{11}	2SC1735	$D_{5,6}$	WZ-240
Q_{12}	2SC869		


1
2
3
A
B
C
D
R31 47
R29 47
R30 47
R32 47
C17 3.3/50
C25 22/16
Q7 2SC1775A
Q9 2SA872A
Q10 2SA872A
Q8 2SC1775A
C26 22/16
C18 3.3/50
C30 22/16
C19 0.0018
C20 0.0018
C31 22/16
R36 220K
R35 220K
49V
-49V
-0.6V
0.6V
R33 56
D1
IS2473×2
D2
D4
IS2473×2
D3
R34 56
C23 0.0047
R26 220
C24 0.0047
R25 220
R27 680
R28 680
R21 75K
R22 75K
R23 39K
R24 39K
C21 470P
C22 470P
C16 10P
Q6 2SC1775A
C9 3500P
C10 3500P
-48.5V
Q5 2SC1775A
C27 220/63
R17 910K
R15 75K
R16 75K
R18 910K
C28 220/63
C16 10P
48.5V
R19 220
C7 1000P
C8 1000P
R20 220
R40 120
C11 470/6.3
C12 470/6.3
R41 51K
C13 27P
C14 27P
R37 4.7K
R39 47K
R38 47K
R42 47K
R13 1.54K
R14 1.54K
R8 120K
0V
R43 4.7K
Q3 2SA726S
Q4 2SA726S
WZ-240
D6 WZ-240
C29 100/35
D5
R7 120K
R11 1K
R12 1K
C32 100/35
R9 4.7K
R10 4.7K
Q1 2SA726S
Q2 2SA726S
Q11
Q12
Q14
Q13
24V
49.5V
24.6V
R5 2.2K
R6 2.2K
2SC1735
2SC869
C3 47P
C4 47P
2SA628A
2SA850
R3 100K
R4 100K
R44 150
C5 68P
R1 100K
R2 100K
C6 68P
R45 150
R46 15K
C1 1
C2 1
R47 15K
10
9
8
7
6
5
4
3
2
1
AWS-094, No.19
AWH-048, No.3
AWM-091, No.1
AWR-106, No.11
AWG-042, No.11
AWS-094, No.29
AWS-094, No.20
AWH-048, No.2
AWR-106, No.13
AWG-042, No.10
AWS-094, No.23

Parts List of Equalizer Amplifier Assembly (AWF-021)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SA726S-G
Q2	Transistor	2SA726S-G
Q3	Transistor	2SA726S-G
Q4	Transistor	2SA726S-G
Q5	Transistor	2SC1775A-D
Q6	Transistor	2SC1775A-D
Q7	Transistor	2SC1775A-D
Q8	Transistor	2SC1775A-D
Q9	Transistor	2SA872A-D
Q10	Transistor	2SA872A-D
Q11	Transistor	2SC1735-D
Q12	Transistor	2SC869-C
Q13	Transistor	2SA850-D
Q14	Transistor	2SA628A-C
D1	Diode	1S2473
D2	Diode	1S2473
D3	Diode	1S2473
D4	Diode	1S2473
D5	Zener diode	WZ-240
D6	Zener diode	WZ-240

RESISTORS

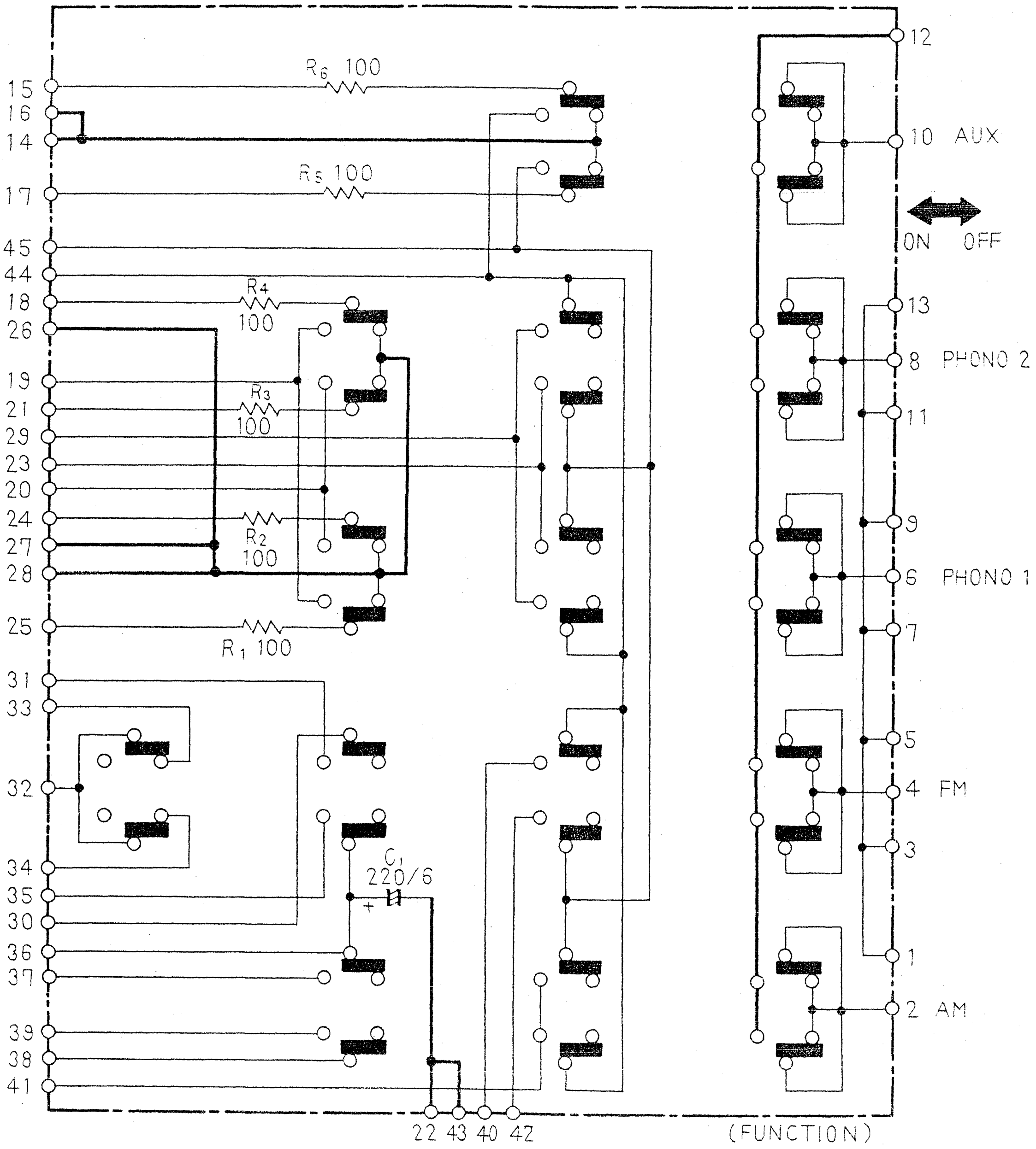
Symbol	Description	Part No.
R1	Carbon film 100k	RD¼PS 104JNL
R2	Carbon film 100k	RD¼PS 104JNL
R3	Carbon film 100k	RD¼PS 104JNL
R4	Carbon film 100k	RD¼PS 104JNL
R5	Carbon film 2.2k	RD¼PS 222J
R6	Carbon film 2.2k	RD¼PS 222J
R7	Carbon film 120k	RD¼PS 124JNL
R8	Carbon film 120k	RD¼PS 124JNL
R9	Carbon film 4.7k	RD¼PS 472J
R10	Carbon film 4.7k	RD¼PS 472J
R11	Carbon film 1k	RD¼PS 102J
R12	Carbon film 1k	RD¼PS 102J
R13	Metal film 1.54k ½W	RN½SR 1541F
R14	Metal film 1.54k ½W	RN½SR 1541F
R15	Metal film 75.0k ½W	RN½SR 7502F
R16	Metal film 75.0k ½W	RN½SR 7502F
R17	Metal film 910k ½W	RN½SR 9103F
R18	Metal film 910k ½W	RN½SR 9103F
R19	Carbon film 220	RD¼PS 221J
R20	Carbon film 220	RD¼PS 221J
R21	Carbon film 75k	RD¼PS 753JNL
R22	Carbon film 75k	RD¼PS 753JNL
R23	Carbon film 39k	RD¼PS 393J
R24	Carbon film 39k	RD¼PS 393J
R25	Carbon film 220	RD¼PS 221J
R26	Carbon film 220	RD¼PS 221J
R27	Carbon film 680	RD¼PS 681J
R28	Carbon film 680	RD¼PS 681J
R29	Carbon film 47	RD¼PS 470J
R30	Carbon film 47	RD¼PS 470J
R31	Carbon film 47	RD¼PS 470J
R32	Carbon film 47	RD¼PS 470J
R33	Carbon film 56	RD¼PS 560J
R34	Carbon film 56	RD¼PS 560J
R35	Carbon film 220k	RD¼PS 224J
R36	Carbon film 220k	RD¼PS 224J
R37	Carbon film 4.7k	RD¼PS 472J
R38	Carbon film 47k	RD¼PS 473J
R39	Carbon film 47k	RD¼PS 473J
R40	Carbon film 120	RD¼PS 121J
R41	Carbon film 51k	RD¼PS 513J
R42	Carbon film 47k	RD¼PS 473J
R43	Carbon film 4.7k	RD¼PS 472J
R44	Carbon film 150	RD¼PSF 151J
R45	Carbon film 150	RD¼PSF 151J
R46	Carbon film 15k	RD¼PS 153J
R47	Carbon film 15k	RD¼PS 153J

CAPACITORS

Symbol	Description	Part No.
C1	Metallized mylar 1 100V	ACE-008
C2	Metallized mylar 1 100V	ACE-008
C3	Ceramic 47p 50V	CCDSL 470K 50
C4	Ceramic 47p 50V	CCDSL 470K 50
C5	Ceramic 68p 50V	CCDSL 680K 50
C6	Ceramic 68p 50V	CCDSL 680K 50
C7	Polystyrene film 1000p 50V	CQSA 102F 50
C8	Polystyrene film 1000p 50V	CQSA 102F 50
C9	Polystyrene film 3500p 50V	CQSA 352F 50
C10	Polystyrene film 3500p 50V	CQSA 352F 50
C11	Electrolytic 470 6V	CEA 471P 6
C12	Electrolytic 470 6V	CEA 471P 6
C13	Ceramic 27p 50V	CCDSL 270K 50
C14	Ceramic 27p 50V	CCDSL 270K 50
C15	Ceramic 10p 50V	CCDSL 100K 50
C16	Ceramic 10p 50V	CCDSL 100K 50
C17	Electrolytic 3.3 50V	CEANL 3R3P 50
C18	Electrolytic 3.3 50V	CEANL 3R3P 50
C19	Mylar 0.0018 50V	CQMA 182K 50
C20	Mylar 0.0018 50V	CQMA 182K 50
C21	Ceramic 470p 50V	CKDYB 471K 50
C22	Ceramic 470p 50V	CKDYB 471K 50
C23	Mylar 0.0047 50V	CQMA 472K 50

Symbol	Description			Part No.
C24	Mylar	0.0047	50V	CQMA 472K 50
C25	Electrolytic	22	16V	CSZA 220M 16
C26	Electrolytic	22	16V	CSZA 220M 16
C27	Electrolytic	220	63V	CEA 221P 63
C28	Electrolytic	220	63V	CEA 221P 63
C29	Electrolytic	100	35V	CEA 101P 35
C30	Electrolytic	22	16V	CSZA 220M 16
C31	Electrolytic	22	16V	CSZA 220M 16
C32	Electrolytic	100	35V	CEA 101P 35

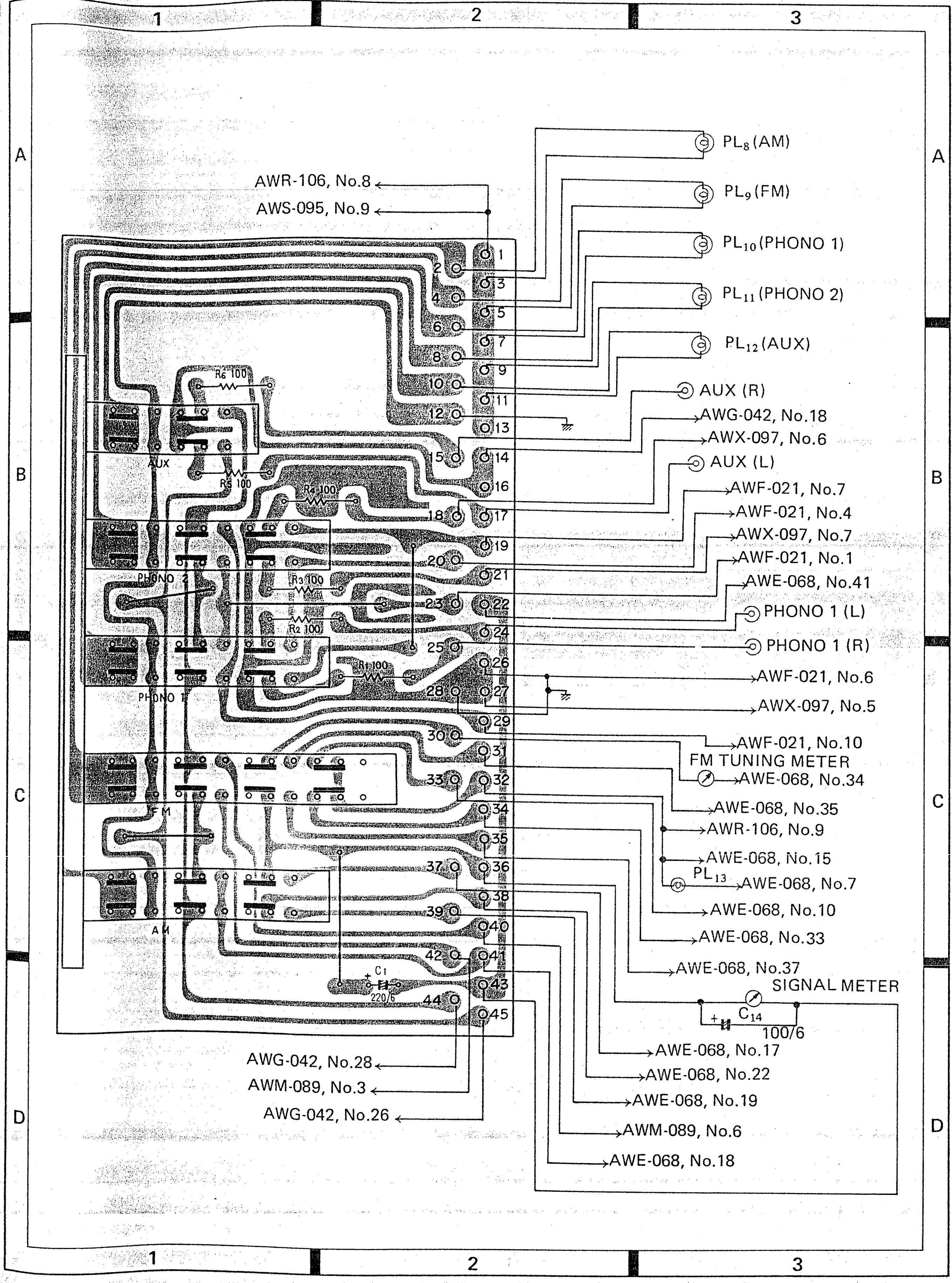
12.8 FUNCTION SWITCH ASSEMBLY (AWS-094)



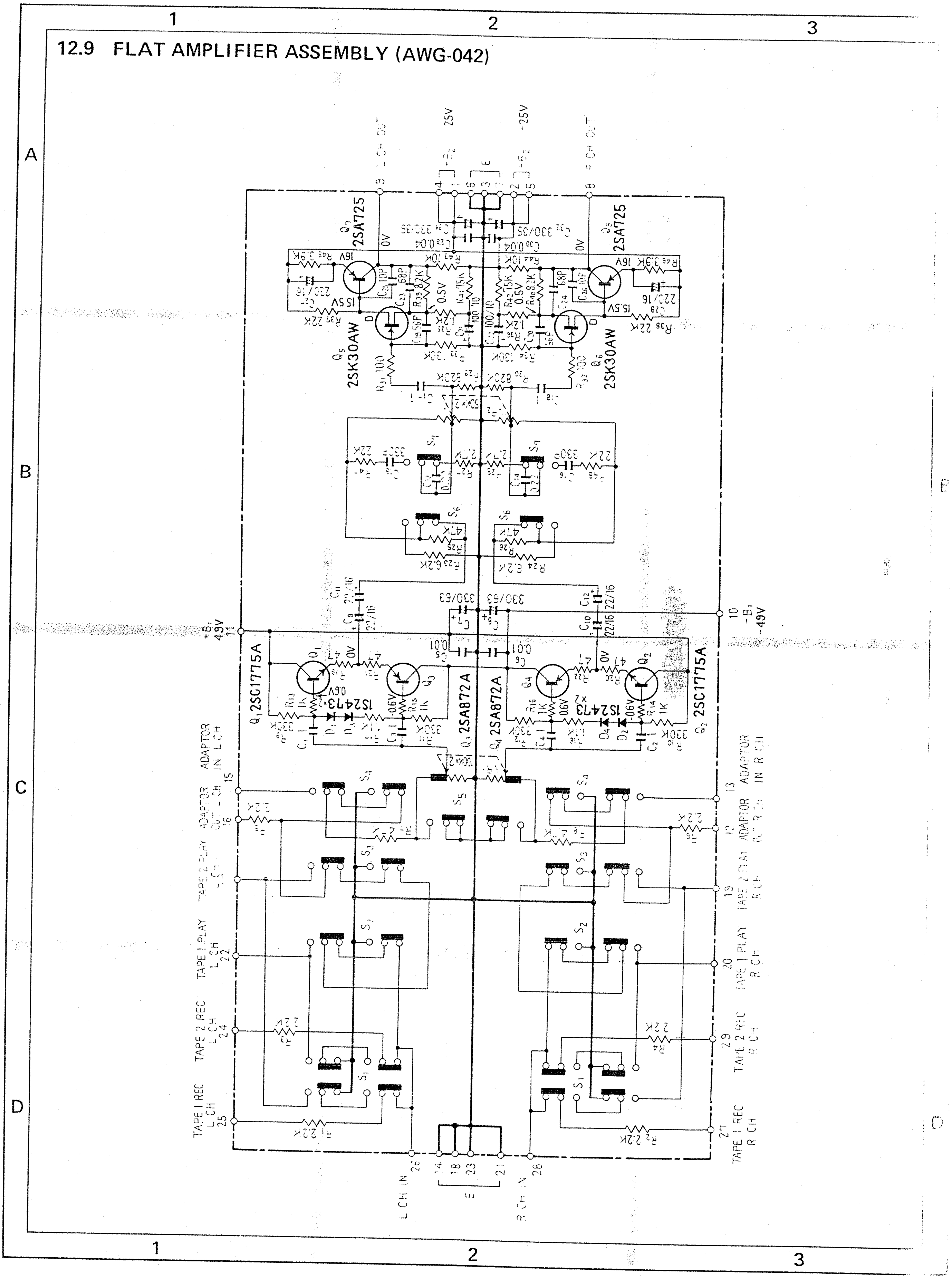
R6 100
R5 100
R4 100
R3 100
R2 100
R1 100
C1 220/6
15
16
14
17
45
44
18
26
19
21
29
23
20
24
27
28
25
31
33
32
34
35
30
36
37
39
38
41
22 43 40 42
12
10 AUX
ON OFF
13
8 PHONO 2
11
9
6 PHONO 1
7
5
4 FM
3
1
2 AM
(FUNCTION)

Parts List of Function Switch Assembly (AWS-094)

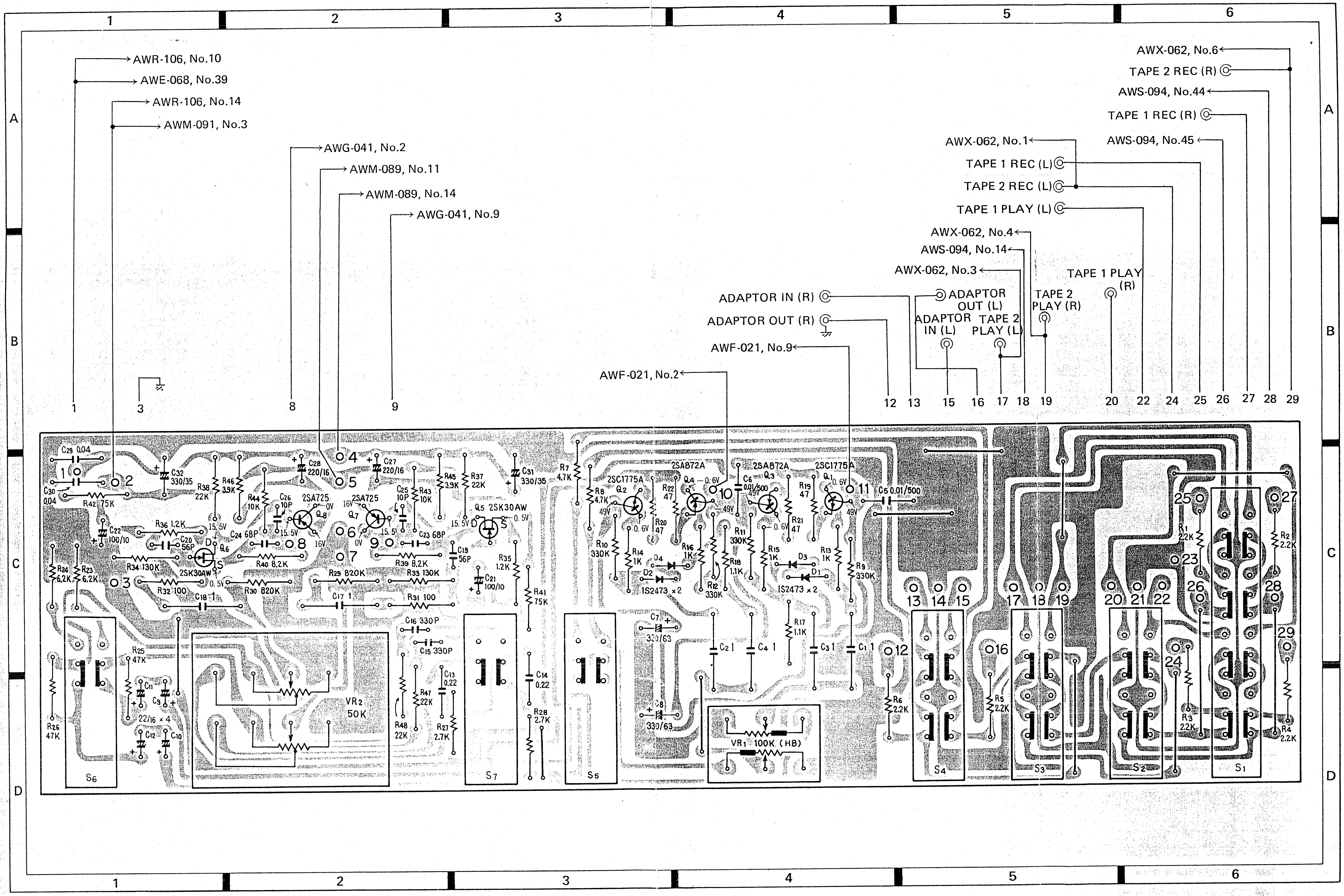
Symbol	Description	Part No.
S1	Push switch (FUNCTION)	ASG-095
R1	Carbon film resistor 100	RD¼PS 101J
R2	Carbon film resistor 100	RD¼PS 101J
R3	Carbon film resistor 100	RD¼PS 101J
R4	Carbon film resistor 100	RD¼PS 101J
R5	Carbon film resistor 100	RD¼PS 101J
R6	Carbon film resistor 100	RD¼PS 101J
C1	Electrolytic capacitor 220 6V	CEA 221P 6


1
2
3
A
B
C
D
PL8 (AM)
PL9 (FM)
PL10 (PHONO 1)
PL11 (PHONO 2)
PL12 (AUX)
AWR-106, No.8
AWS-095, No.9
AUX (R)
AWG-042, No.18
AWX-097, No.6
AUX (L)
AWF-021, No.7
AWF-021, No.4
AWX-097, No.7
AWF-021, No.1
AWE-068, No.41
PHONO 1 (L)
PHONO 1 (R)
AWF-021, No.6
AWX-097, No.5
AWF-021, No.10
FM TUNING METER
AWE-068, No.34
AWE-068, No.35
AWR-106, No.9
AWE-068, No.15
PL13
AWE-068, No.7
AWE-068, No.10
AWE-068, No.33
AWE-068, No.37
SIGNAL METER
C14
100/6
AWE-068, No.17
AWE-068, No.22
AWE-068, No.19
AWM-089, No.6
AWE-068, No.18
AWG-042, No.28
AWM-089, No.3
AWG-042, No.26
R6 100
R5 100
R4 100
R3 100
R2 100
R1 100
C1
220/6
AUX
PHONO 2
PHONO 1
FM
AM
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45

12.9 FLAT AMPLIFIER ASSEMBLY (AWG-042)



1
2
3
A
B
C
D
L CH OUT
R CH OUT
-B2 25V
-B2 -25V
E
+B1 49V
-B1 -49V
Q7 2SA725
Q8 2SA725
Q5 2SK30AW
Q6 2SK30AW
Q1 2SC1775A
Q2 2SC1775A
Q3 2SA872A
Q4 2SA872A
1S2473×2
C31 330/35
C32 330/35
C29 0.04
C30 0.04
C7 330/63
C8 330/63
C5 0.01
C6 0.01
C9 22/16
C10 22/16
C11 22/16
C12 22/16
R45 3.9K
R46 3.9K
R37 22K
R38 22K
C27 220/16
C28 220/16
R43 10K
R44 10K
R39 8.2K
R40 8.2K
R41 75K
R42 75K
R29 820K
R30 820K
R31 100
R32 100
R33 130K
R34 130K
R35 1.2K
R36 1.2K
R23 6.2K
R24 6.2K
R25 47K
R26 47K
R27 2.7K
R28 2.7K
R47 22K
R48 22K
C15 330P
C16 330P
C13 0.22
C14 0.22
R9 330K
R10 330K
R11 330K
R12 330K
R13 1K
R14 1K
R15 1K
R16 1K
R17 1.1K
R18 1.1K
R19 47
R20 47
R21 47
R22 47
0.6V
-0.6V
0V
15.5V
16V
0.5V
10P
68P
56P
100/10
50K×2
100K×2
S1
S2
S3
S4
S5
S6
S7
R1 2.2K
R2 2.2K
R3 2.2K
R4 2.2K
R5 2.2K
R6 2.2K
R7 4.7K
R8 4.7K
ADAPTOR IN L CH 15
ADAPTOR OUT L CH 16
TAPE 2 PLAY L CH 17
TAPE 1 PLAY L CH 22
TAPE 2 REC L CH 24
TAPE 1 REC L CH 25
ADAPTOR IN R CH 13
ADAPTOR OUT R CH 12
TAPE 2 PLAY R CH 19
TAPE 1 PLAY R CH 20
TAPE 2 REC R CH 29
TAPE 1 REC R CH 27
L CH IN 26
R CH IN 28
14 18 23 21 E


AWR-106, No.10
AWE-068, No.39
AWR-106, No.14
AWM-091, No.3
AWG-041, No.2
AWM-089, No.11
AWM-089, No.14
AWG-041, No.9
AWX-062, No.6
TAPE 2 REC (R)
AWS-094, No.44
TAPE 1 REC (R)
AWX-062, No.1
AWS-094, No.45
TAPE 1 REC (L)
TAPE 2 REC (L)
TAPE 1 PLAY (L)
AWX-062, No.4
AWS-094, No.14
AWX-062, No.3
TAPE 1 PLAY (R)
ADAPTOR IN (R)
ADAPTOR OUT (L)
TAPE 2 PLAY (R)
ADAPTOR OUT (R)
ADAPTOR IN (L)
TAPE 2 PLAY (L)
AWF-021, No.9
AWF-021, No.2
2SA725
2SK30AW
2SC1775A
2SA872A
IS2473 × 2
VR2 50K
VR1 100K (HB)
S1
S2
S3
S4
S5
S6
S7

Parts List of Flat Amplifier Assembly (AWG-042)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SC1775A-E
Q2	Transistor	2SC1775A-E
Q3	Transistor	2SA872A-E
Q4	Transistor	2SA872A-E
Q5	FET	2SK30AW-Y
Q6	FET	2SK30AW-Y
Q7	Transistor	2SA725-G
Q8	Transistor	2SA725-G
D1	Diode	1S2473
D2	Diode	1S2473
D3	Diode	1S2473
D4	Diode	1S2473

SWITCHES

Symbol	Description	Part No.
S1	Lever switch (DUPLICATE)	ASK-084
S2	Lever switch (MONITOR 1)	ASK-092
S3	Lever switch (MONITOR 2)	ASK-092
S4	Lever switch (ADAPTOR)	ASK-092
S5	Lever switch (MODE)	ASK-090
S6	Lever switch (MUTING)	ASK-090
S7	Lever switch (LOUDNESS)	ASK-090

RESISTORS

Symbol	Description	Part No.
VR1	Variable (100k-HB BALANCE)	ACV-163
VR2	Variable (50k-B2 VOLUME)	ACV-169
R1	Carbon film 2.2k	RD¼PS 222J
R2	Carbon film 2.2k	RD¼PS 222J
R3	Carbon film 2.2k	RD¼PS 222J
R4	Carbon film 2.2k	RD¼PS 222J
R5	Carbon film 2.2k	RD¼PS 222J
R6	Carbon film 2.2k	RD¼PS 222J
R7	Carbon film 4.7k	RD¼PS 472J
R8	Carbon film 4.7k	RD¼PS 472J
R9	Carbon film 330k	RD¼PS 334JNL
R10	Carbon film 330k	RD¼PS 334JNL
R11	Carbon film 330k	RD¼PS 334JNL
R12	Carbon film 330k	RD¼PS 334JNL
R13	Carbon film 1k	RD¼PS 102J
R14	Carbon film 1k	RD¼PS 102J
R15	Carbon film 1k	RD¼PS 102J
R16	Carbon film 1k	RD¼PS 102J
R17	Carbon film 1.1k	RD¼PS 112J
R18	Carbon film 1.1k	RD¼PS 112J
R19	Carbon film 47	RD¼PS 470J
R20	Carbon film 47	RD¼PS 470J
R21	Carbon film 47	RD¼PS 470J
R22	Carbon film 47	RD¼PS 470J
R23	Carbon film 6.2k	RD¼PS 622J
R24	Carbon film 6.2k	RD¼PS 622J
R25	Carbon film 47k	RD¼PS 473JNL
R26	Carbon film 47k	RD¼PS 473JNL
R27	Carbon film 2.7k	RD¼PS 272J
R28	Carbon film 2.7k	RD¼PS 272J
R29	Carbon film 820k	RD¼PS 824JNL
R30	Carbon film 820k	RD¼PS 824JNL
R31	Carbon film 100	RD¼PS 101J
R32	Carbon film 100	RD¼PS 101J
R33	Carbon film 130k	RD¼PS 134JNL
R34	Carbon film 130k	RD¼PS 134JNL
R35	Carbon film 1.2k	RD¼PS 122J
R36	Carbon film 1.2k	RD¼PS 122J
R37	Carbon film 22k	RD¼PS 223J
R38	Carbon film 22k	RD¼PS 223J
R39	Carbon film 8.2k	RD¼PS 822J
R40	Carbon film 8.2k	RD¼PS 822J
R41	Carbon film 75k	RD¼PS 753JNL
R42	Carbon film 75k	RD¼PS 753JNL
R43	Carbon film 10k	RD¼PS 103J
R44	Carbon film 10k	RD¼PS 103J
R45	Carbon film 3.9k	RD¼PS 392J
R46	Carbon film 3.9k	RD¼PS 392J
R47	Carbon film 22k	RD¼PS 223J
R48	Carbon film 22k	RD¼PS 223J

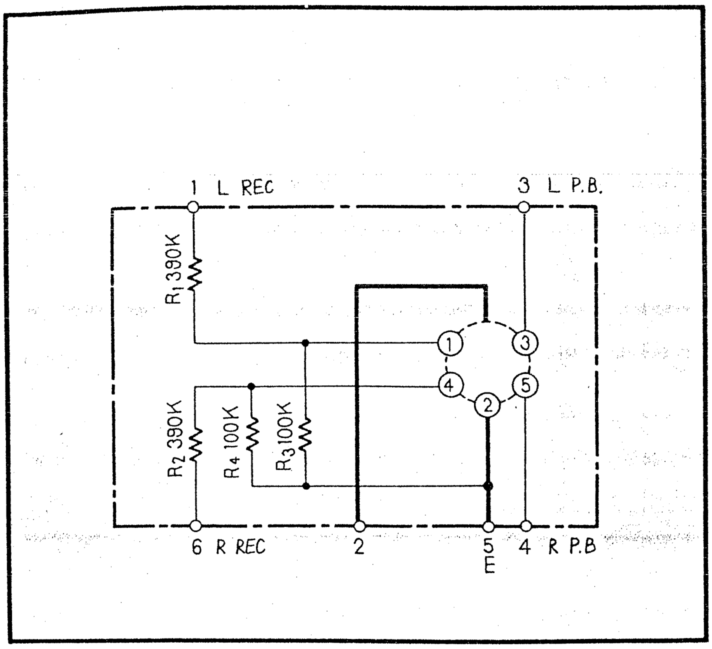
CAPACITORS

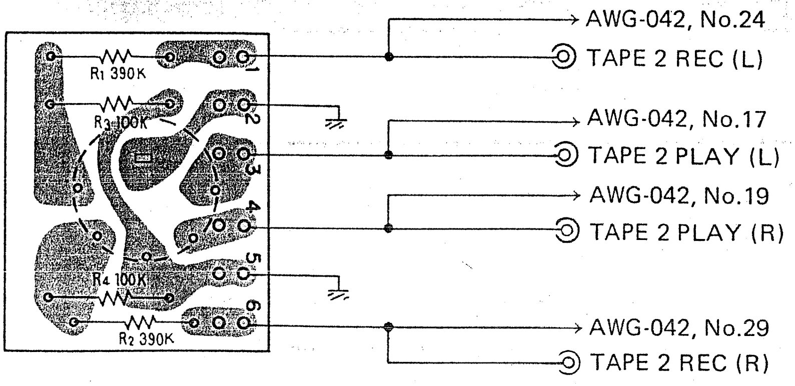
Symbol	Description	Part No.
C1	Metallized mylar 1 100V	ACE-008
C2	Metallized mylar 1 100V	ACE-008
C3	Metallized mylar 1 100V	ACE-008
C4	Metallized mylar 1 100V	ACE-008
C5	Ceramic 0.01 500V	CKDYF 103Z 500
C6	Ceramic 0.01 500V	CKDYF 103Z 500
C7	Electrolytic 330 63V	CEA 331P 63
C8	Electrolytic 330 63V	CEA 331P 63
C9	Electrolytic 22 16V	CSZA 220M 16
C10	Electrolytic 22 16V	CSZA 220M 16
C11	Electrolytic 22 16V	CSZA 220M 16
C12	Electrolytic 22 16V	CSZA 220M 16
C13	Mylar 0.22 50V	CQMA 224J 50
C14	Mylar 0.22 50V	CQMA 224J 50
C15	Ceramic 330R 50V	CKDYB 331K 50
C16	Ceramic 330p 50V	CKDYB 331K 50
C17	Metallized mylar 1 100V	ACE-008
C18	Metallized mylar 1 100V	ACE-008
C19	Ceramic 56p 50V	CCDSL 560K 50
C20	Ceramic 56p 50V	CCDSL 560K 50
C21	Electrolytic 100 10V	CEANL 101P 10
C22	Electrolytic 100 10V	CEANL 101P 10
C23	Ceramic 68p 50V	CCDSL 680K 50
C24	Ceramic 68p 50V	CCDSL 680K 50
C25	Ceramic 10p 50V	CCDSL 100F 50
C26	Ceramic 10p 50V	CCDSL 100F 50
C27	Electrolytic 220 16V	CEANL 221P 16
C28	Electrolytic 220 16V	CEANL 221P 16
C29	Ceramic 0.04 50V	CKDYF 403Z 50
C30	Ceramic 0.04 50V	CKDYF 403Z 50
C31	Electrolytic 330 35V	CEA 331P 35
C32	Electrolytic 330 35V	CEA 331P 35

OTHERS

Symbol	Description	Part No.
	Screw	ABA-116
	Union nut	ABN-021
	Washer faced nut	ABN-024

12.10 5P CONNECTOR ASSEMBLY (AWX-062)

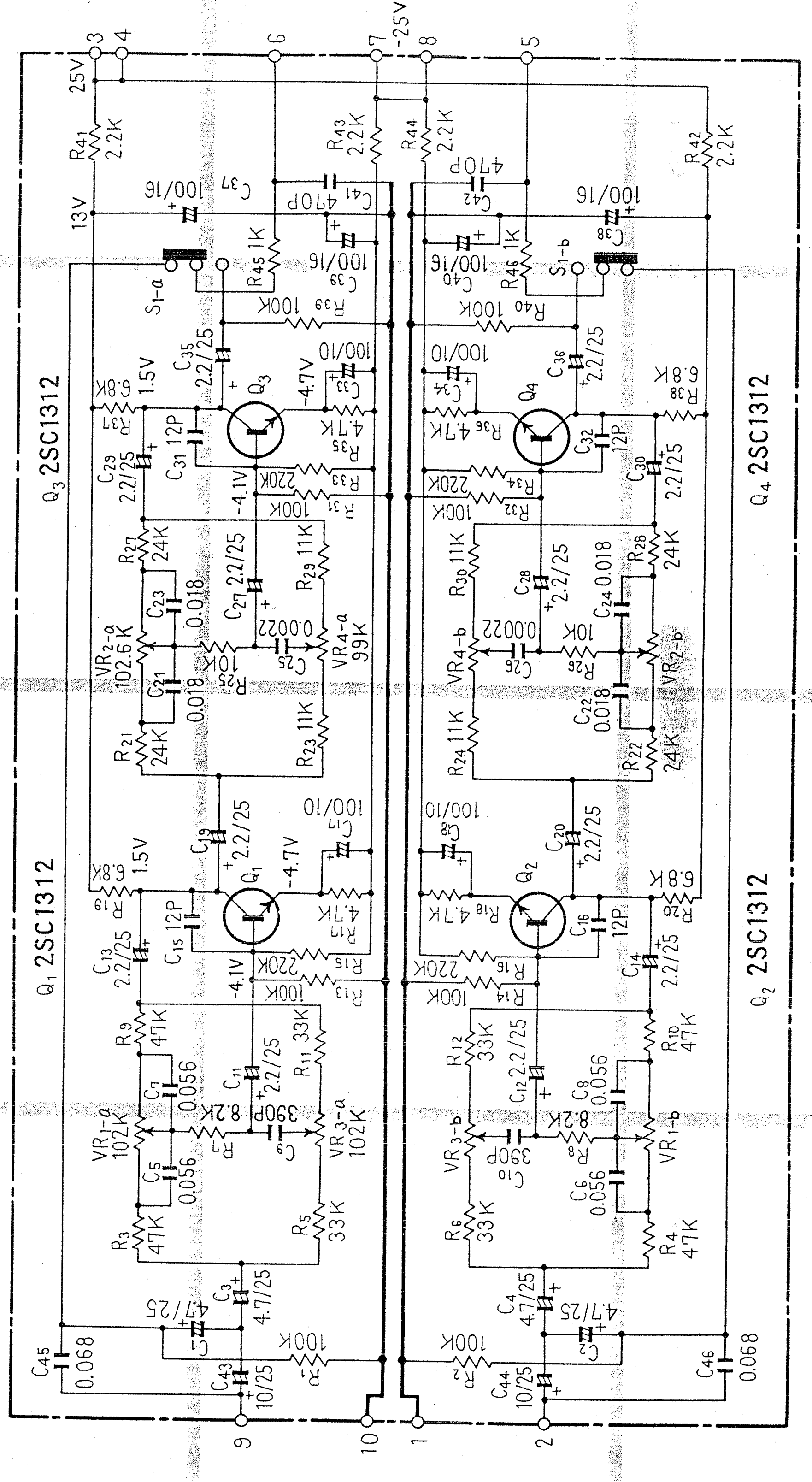

1 L REC
3 L P.B.
R1 390K
①
③
④
⑤
②
R2 390K
R4 100K
R3 100K
6 R REC
2
5
E
4 R P.B


R1 390K
R3 100K
R4 100K
R2 390K
1
2
3
4
5
6
AWG-042, No.24
TAPE 2 REC (L)
AWG-042, No.17
TAPE 2 PLAY (L)
AWG-042, No.19
TAPE 2 PLAY (R)
AWG-042, No.29
TAPE 2 REC (R)

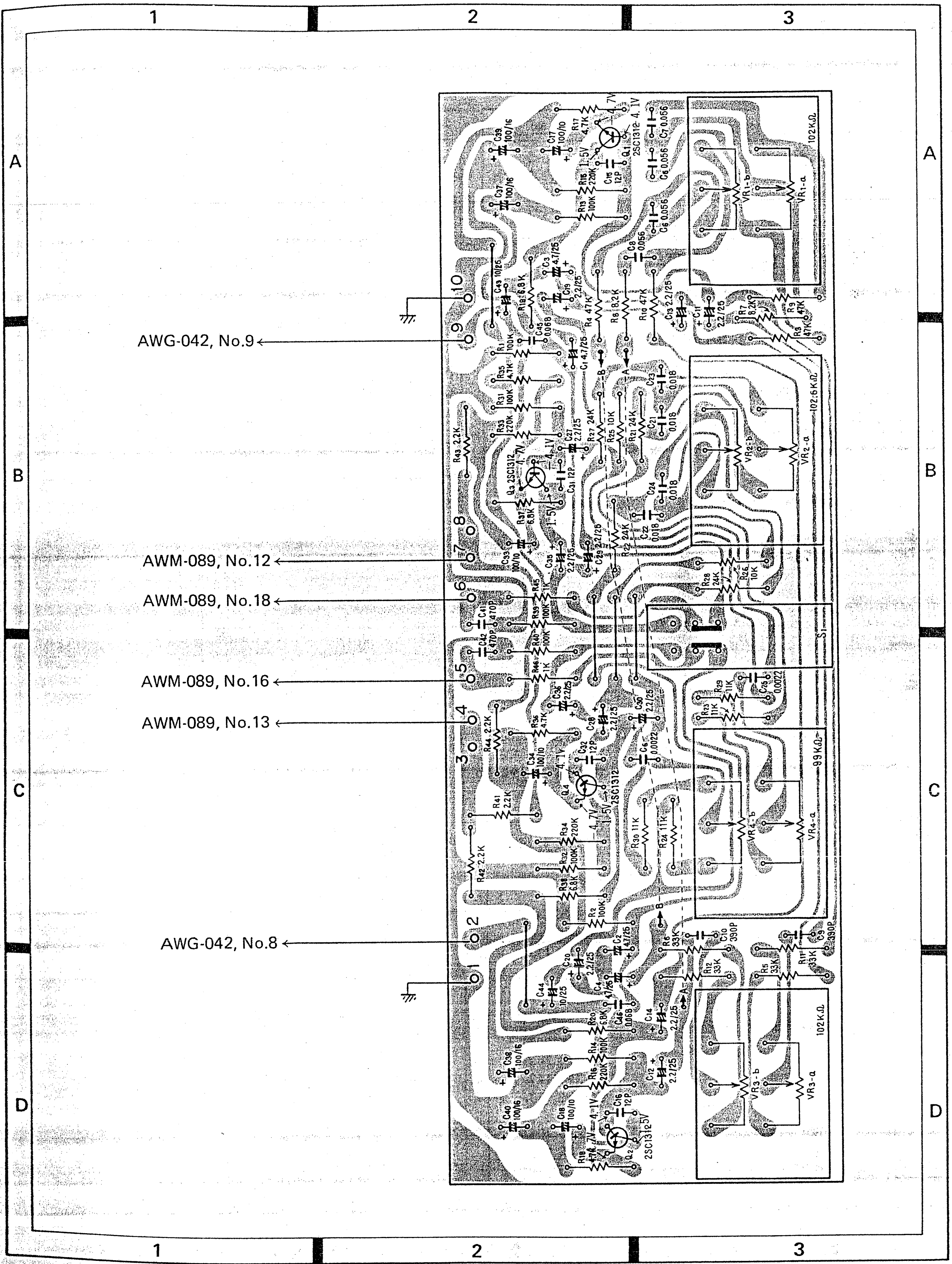
Parts List of 5P Connector Assembly (AWX-062)

Symbol	Description		Part No.
R1	Carbon film resistor	390k	RD¼PS 394J
R2	Carbon film resistor	390k	RD¼PS 394J
R3	Carbon film resistor	100k	RD¼PS 104J
R4	Carbon film resistor	100k	RD¼PS 104J
	Connector socket 5p (REC/PLAY)		AKP-007

12.11 CONTROL AMPLIFIER ASSEMBLY (AWG-041)



Q3 2SC1312
Q1 2SC1312
Q4 2SC1312
Q2 2SC1312
25V
13V
-25V
1.5V
-4.7V
-4.1V
R41 2.2K
R42 2.2K
R43 2.2K
R44 2.2K
R45 1K
R46 1K
C37 100/16
C38 100/16
C39 100/16
C40 100/16
C41 470P
C42 470P
S1-a
S1-b
R39 100K
R40 100K
C35 2.2/25
C36 2.2/25
C33 100/10
C34 100/10
R35 4.7K
R36 4.7K
R37 6.8K
R38 6.8K
C31 12P
C32 12P
C29 2.2/25
C30 2.2/25
R33 220K
R34 220K
R31 100K
R32 100K
R27 24K
R28 24K
R29 11K
R30 11K
C27 2.2/25
C28 2.2/25
C23 0.018
C24 0.018
C21 0.018
C22 0.018
VR2-a 102.6K
VR2-b
R25 10K
R26 10K
C25 0.0022
C26 0.0022
VR4-a 99K
VR4-b
R21 24K
R22 24K
R23 11K
R24 11K
C19 2.2/25
C20 2.2/25
C17 100/10
C18 100/10
R19 6.8K
R20 6.8K
R17 4.7K
R18 4.7K
C15 12P
C16 12P
C13 2.2/25
C14 2.2/25
R15 220K
R16 220K
R13 100K
R14 100K
R9 47K
R10 47K
R11 33K
R12 33K
C11 2.2/25
C12 2.2/25
C7 0.056
C8 0.056
C5 0.056
C6 0.056
VR1-a 102K
VR1-b
R7 8.2K
R8 8.2K
C9 390P
C10 390P
VR3-a 102K
VR3-b
R3 47K
R4 47K
R5 33K
R6 33K
C3 4.7/25
C4 4.7/25
C1 4.7/25
C2 4.7/25
R1 100K
R2 100K
C43 10/25
C44 10/25
C45 0.068
C46 0.068
Q1
Q2
Q3
Q4
1
2
3
4
5
6
7
8
9
10
A
B
C
D


1
2
3
A
B
C
D
AWG-042, No.9
AWM-089, No.12
AWM-089, No.18
AWM-089, No.16
AWM-089, No.13
AWG-042, No.8
1
2
3
4
5
6
7
8
9
10
VR1-a
VR1-b
102KΩ
VR2-a
VR2-b
102:6KΩ
VR4-a
VR4-b
99KΩ
VR3-a
VR3-b
102KΩ
S1
Q1 2SC1312
Q2 2SC1312
Q3 2SC1312
Q4 2SC1312

Parts List of Control Amplifier Assembly (AWG-041)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SC1312-G
Q2	Transistor	2SC1312-G
Q3	Transistor	2SC1312-G
Q4	Transistor	2SC1312-G

RESISTORS AND POTENTIOMETERS

Symbol	Description	Part No.
VR1	Variable resistor (102k, 5-step, BASS 50Hz)	ACV-165
VR2	Variable resistor (102.6k, 11-step, BASS 100Hz)	ACV-166
VR3	Variable resistor (102k, 5-step, TREBLE 20kHz)	ACV-168
VR4	Variable resistor (99k, 11-step, TREBLE 10kHz)	ACV-167
R1	Carbon film 100k	RD¼PS 104J
R2	Carbon film 100k	RD¼PS 104J
R3	Carbon film 47k	RD¼PS 473J
R4	Carbon film 47k	RD¼PS 473J
R5	Carbon film 33k	RD¼PS 333J
R6	Carbon film 33k	RD¼PS 333J
R7	Carbon film 8.2k	RD¼PS 822J
R8	Carbon film 8.2k	RD¼PS 822J
R9	Carbon film 47k	RD¼PS 473J
R10	Carbon film 47k	RD¼PS 473J
R11	Carbon film 33k	RD¼PS 333J
R12	Carbon film 33k	RD¼PS 333J
R13	Carbon film 100k	RD¼PS 104JNL
R14	Carbon film 100k	RD¼PS 104JNL
R15	Carbon film 220k	RD¼PS 224JNL
R16	Carbon film 220k	RD¼PS 224JNL
R17	Carbon film 4.7k	RD¼PS 472J
R18	Carbon film 4.7k	RD¼PS 472J
R19	Carbon film 6.8k	RD¼PS 682J
R20	Carbon film 6.8k	RD¼PS 682J
R21	Carbon film 24k	RD¼PS 243J
R22	Carbon film 24k	RD¼PS 243J
R23	Carbon film 11k	RD¼PS 113J
R24	Carbon film 11k	RD¼PS 113J
R25	Carbon film 10k	RD¼PS 103J
R26	Carbon film 10k	RD¼PS 103J
R27	Carbon film 24k	RD¼PS 243J
R28	Carbon film 24k	RD¼PS 243J
R29	Carbon film 11k	RD¼PS 113J
R30	Carbon film 11k	RD¼PS 113J
R31	Carbon film 100k	RD¼PS 104JNL
R32	Carbon film 100k	RD¼PS 104JNL
R33	Carbon film 220k	RD¼PS 224JNL
R34	Carbon film 220k	RD¼PS 224JNL
R35	Carbon film 4.7k	RD¼PS 472J
R36	Carbon film 4.7k	RD¼PS 472J
R37	Carbon film 6.8k	RD¼PS 682J
R38	Carbon film 6.8k	RD¼PS 682J
R39	Carbon film 100k	RD¼PS 104J
R40	Carbon film 100k	RD¼PS 104J
R41	Carbon film 2.2k	RD¼PS 222J
R42	Carbon film 2.2k	RD¼PS 222J
R43	Carbon film 2.2k	RD¼PS 222J
R44	Carbon film 2.2k	RD¼PS 222J
R45	Carbon film 1k	RD¼PS 102J
R46	Carbon film 1k	RD¼PS 102J

CAPACITORS

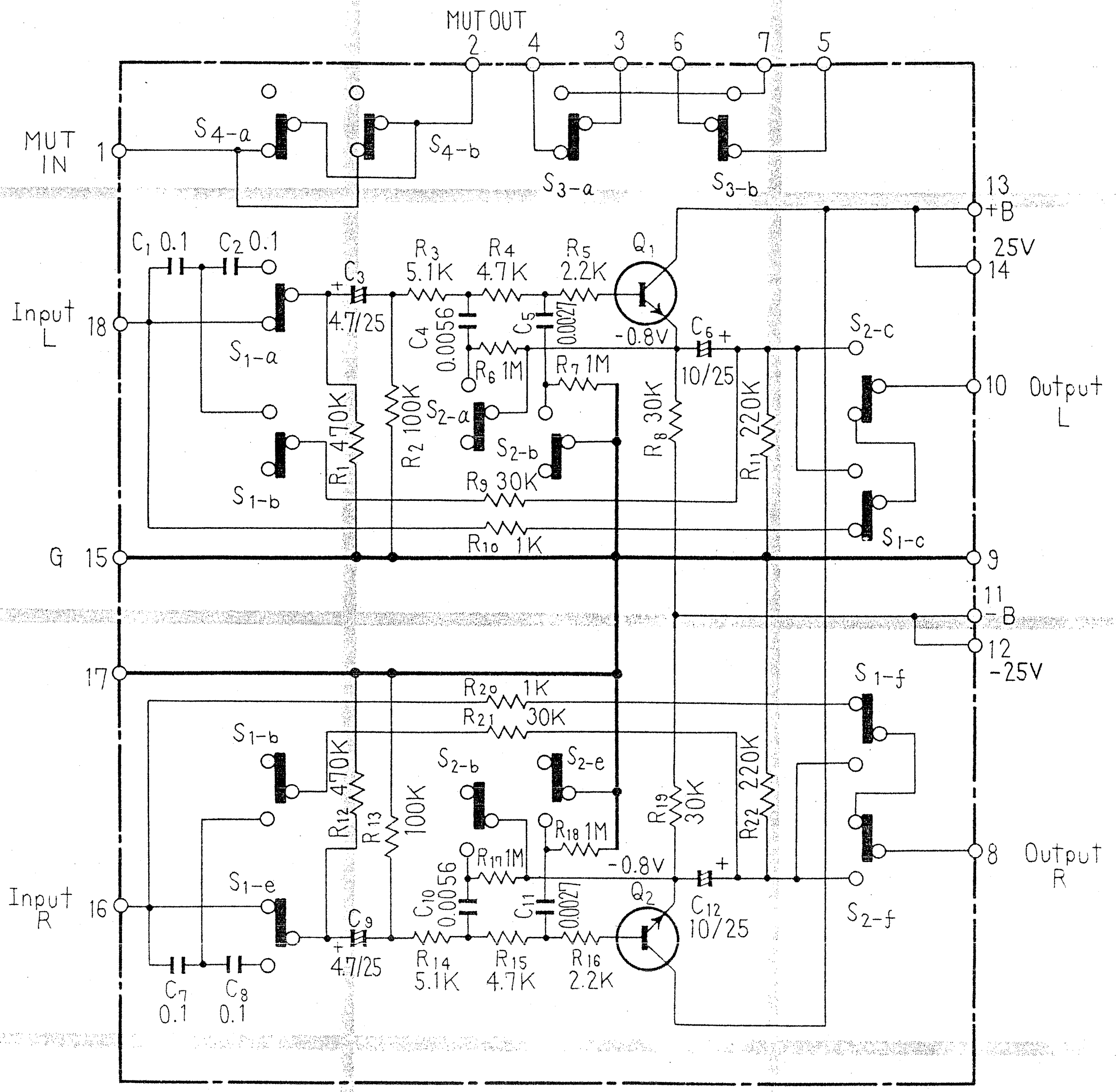
Symbol	Description	Part No.
C1	Electrolytic 4.7 25V	CSZA 4R7M 25
C2	Electrolytic 4.7 25V	CSZA 4R7M 25
C3	Electrolytic 4.7 25V	CSZA 4R7M 25
C4	Electrolytic 4.7 25V	CSZA 4R7M 25
C5	Mylar 0.056 50V	CQMA 563J 50
C6	Mylar 0.056 50V	CQMA 563J 50
C7	Mylar 0.056 50V	CQMA 563J 50
C8	Mylar 0.056 50V	CQMA 563J 50
C9	Polystyrene 390p 50V	CQSA 391J 50
C10	Polystyrene 390p 50V	CQSA 391J 50
C11	Electrolytic 2.2 25V	CEANL 2R2P 25
C12	Electrolytic 2.2 25V	CEANL 2R2P 25
C13	Electrolytic 2.2 25V	CEANL 2R2P 25
C14	Electrolytic 2.2 25V	CEANL 2R2P 25
C15	Ceramic 12p 50V	CCDSL 120K 50
C16	Ceramic 12p 50V	CCDSL 120K 50
C17	Electrolytic 100 10V	ACH-312
C18	Electrolytic 100 10V	ACH-312
C19	Electrolytic 2.2 25V	CEANL 2R2P 25
C20	Electrolytic 2.2 25V	CEANL 2R2P 25
C21	Mylar 0.018 50V	CQMA 183J 50
C22	Mylar 0.018 50V	CQMA 183J 50
C23	Mylar 0.018 50V	CQMA 183J 50
C24	Mylar 0.018 50V	CQMA 183J 50
C25	Ceramic 2200p 50V	CKDYA 222J 50
C26	Ceramic 2200p 50V	CKDYA 222J 50
C27	Electrolytic 2.2 25V	CEANL 2R2P 25
C28	Electrolytic 2.2 25V	CEANL 2R2P 25
C29	Electrolytic 2.2 25V	CEANL 2R2P 25
C30	Electrolytic 2.2 25V	CEANL 2R2P 25

Symbol	Description			Part No.
C31	Ceramic	12p	50V	CCDSL 120K 50
C32	Ceramic	12p	50V	CCDSL 120K 50
C33	Electrolytic	100	10V	ACH-312
C34	Electrolytic	100	10V	ACH-312
C35	Electrolytic	2.2	25V	CEANL 2R2P 25
C36	Electrolytic	2.2	25V	CEANL 2R2P 25
C37	Electrolytic	100	16V	ACH-311
C38	Electrolytic	100	16V	ACH-311
C39	Electrolytic	100	16V	ACH-311
C40	Electrolytic	100	16V	ACH-311
C41	Ceramic	470p	50V	CKDYB 471K 50
C42	Ceramic	470p	50V	CKDYB 471K 50
C43	Electrolytic	10	25V	CSZA 100M 25
C44	Electrolytic	10	25V	CSZA 100M 25
C45	Mylar	0.068	50V	CQMA 683J 50
C46	Mylar	0.068	50V	CQMA 683J 50

OTHERS

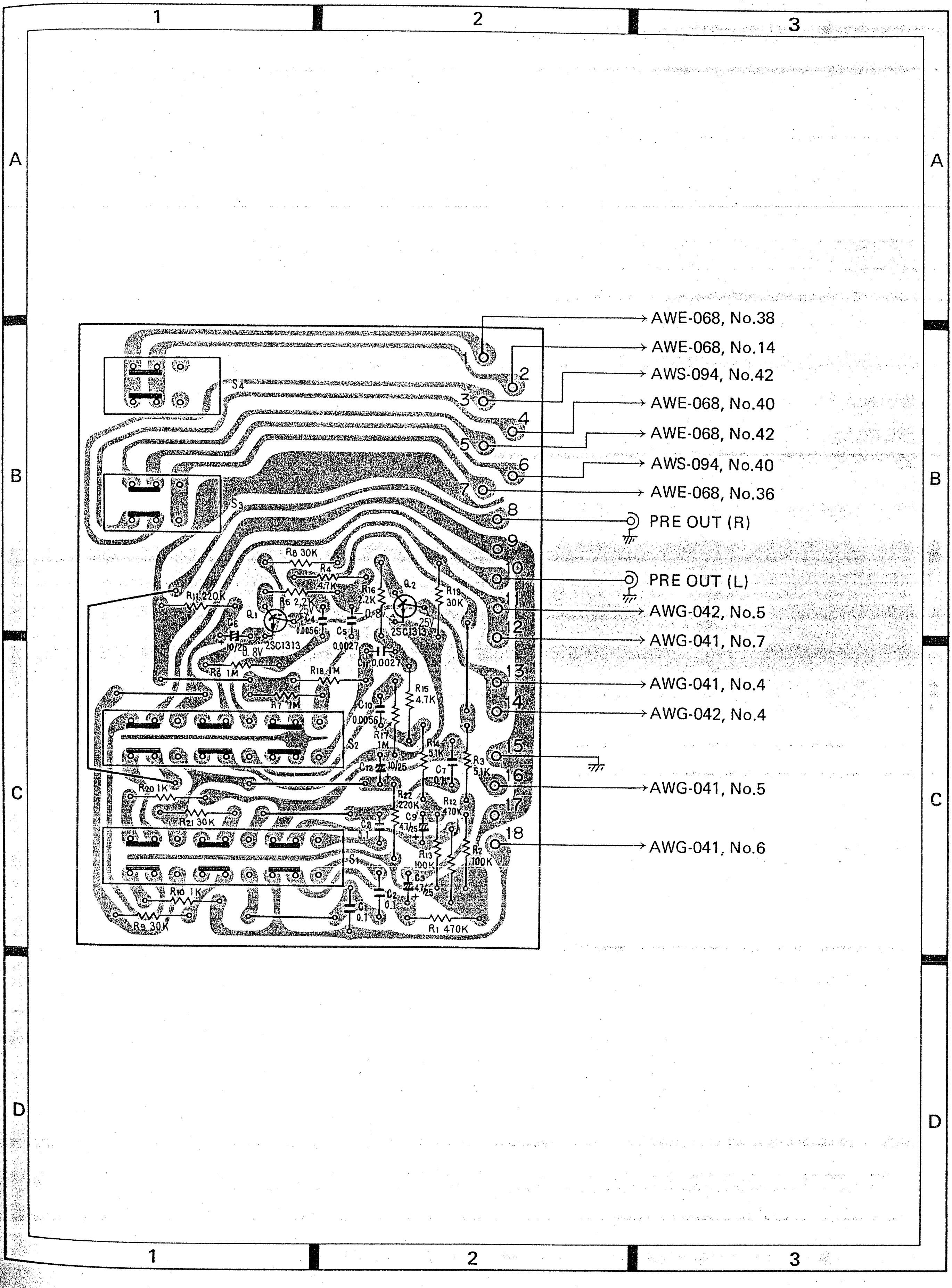
Symbol	Description	Part No.
	Lever switch (TONE)	ASK-090
	Washer faced nut	ABN-024

12.12 FILTER AMPLIFIER ASSEMBLY (AWM-089)


MUT OUT
2
4
3
6
7
5
MUT IN
1
S4-a
S4-b
S3-a
S3-b
13
+B
25V
14
C1 0.1
C2 0.1
C3
4.7/25
R3 5.1K
R4 4.7K
R5 2.2K
Q1
Input L
18
S1-a
C4 0.0056
C5 0.0027
R6 1M
R7 1M
-0.8V
C6
10/25
S2-c
10
Output L
S2-a
S2-b
R1 470K
R2 100K
R8 30K
R11 220K
R9 30K
S1-b
S1-c
R10 1K
G
15
9
11
-B
12
-25V
17
R20 1K
R21 30K
S1-f
S1-b
S2-b
S2-e
R12 470K
R13 100K
R19 30K
R22 220K
R18 1M
R17 1M
8
Output R
S1-e
-0.8V
Input R
16
C10 0.0056
C11 0.0027
Q2
C12
10/25
S2-f
C9
4.7/25
R14 5.1K
R15 4.7K
R16 2.2K
C7 0.1
C8 0.1

SWITCHS
S_1 ; LOW FILTER
S_2 ; HIGH FILTER
S_3 ; MULTIPATH
S_4 ; FM MUTING

TRANSISTORS
Q_1, Q_2 **2SC1313×2**
(2SC1345)


1
2
3
A
B
C
D
AWE-068, No.38
AWE-068, No.14
AWS-094, No.42
AWE-068, No.40
AWE-068, No.42
AWS-094, No.40
AWE-068, No.36
PRE OUT (R)
PRE OUT (L)
AWG-042, No.5
AWG-041, No.7
AWG-041, No.4
AWG-042, No.4
AWG-041, No.5
AWG-041, No.6
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
S4
S3
S2
S1
R8 30K
R4 4.7K
R16 2.2K
R19 30K
R11 220K
R5 2.2K
Q1
Q2
2SC1313
2SC1313
0.8V
25V
C6 10/25
C4 0.0056
C5 0.0027
C11 0.0027
R6 1M
R18 1M
R7 1M
R15 4.7K
C10 0.0056
R17 1M
R14 5.1K
C7 0.1
R3 5.1K
C12 10/25
R22 220K
R12 470K
C9 4.7/25
C8 0.1
R13 100K
R2 100K
C3 4.7/25
C2 0.1
C1 0.1
R1 470K
R20 1K
R21 30K
R10 1K
R9 30K

Parts List of Filter Amplifier Assembly (AWM-089)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SC1313-G (2SC1345-D)
Q2	Transistor	2SC1313-G (2SC1345-D)

SWITCHES

Symbol	Description	Part No.
S1-4	Push switch (LOW FILTER, HIGH FILTER, MULTIPATH, FM MUTING)	ASG-098

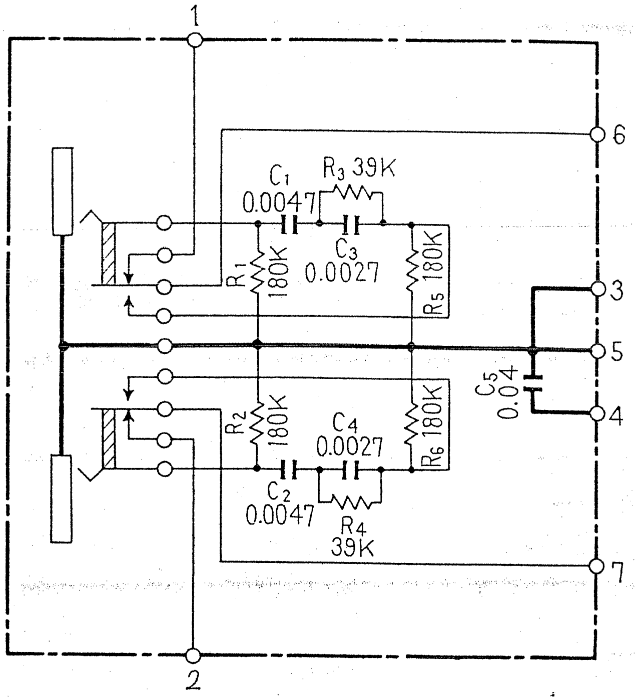
RESISTORS

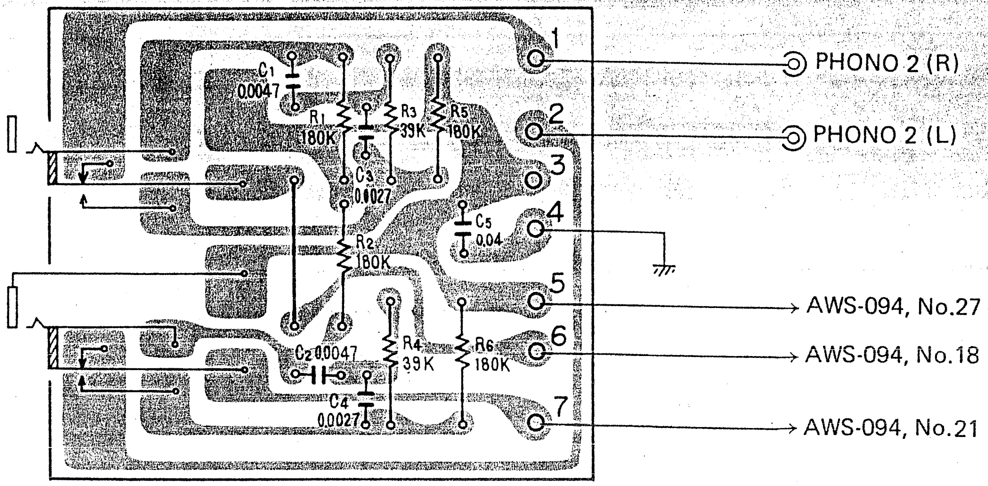
Symbol	Description		Part No.
R1	Carbon film	470k	RD¼PS 474J
R2	Carbon film	100k	RD¼PS 104JNL
R3	Carbon film	5.1k	RD¼PS 512J
R4	Carbon film	4.7k	RD¼PS 472J
R5	Carbon film	2.2k	RD¼PS 222J
R6	Carbon film	1M	RD¼PS 105J
R7	Carbon film	1M	RD¼PS 105J
R8	Carbon film	30k	RD¼PS 303J
R9	Carbon film	30k	RD¼PS 303J
R10	Carbon film	1k	RD¼PS 102J
R11	Carbon film	220k	RD¼PS 224J
R12	Carbon film	470k	RD¼PS 474J
R13	Carbon film	100k	RD¼PS 104JNL
R14	Carbon film	5.1k	RD¼PS 512J
R15	Carbon film	4.7k	RD¼PS 472J
R16	Carbon film	2.2k	RD¼PS 222J
R17	Carbon film	1M	RD¼PS 105J
R18	Carbon film	1M	RD¼PS 105J
R19	Carbon film	30k	RD¼PS 303J
R20	Carbon film	1k	RD¼PS 102J
R21	Carbon film	30k	RD¼PS 303J
R22	Carbon film	220k	RD¼PS 224J

CAPACITORS

Symbol	Description			Part No.
C1	Mylar	0.1	50V	CQMA 104J 50
C2	Mylar	0.1	50V	CQMA 104J 50
C3	Electrolytic	4.7	25V	CSZA 4R7M 25
C4	Ceramic	5600p	50V	CKDYA 562J 50
C5	Ceramic	2700p	50V	CKDYA 272J 50
C6	Electrolytic	10	25V	CSZA 100M 25
C7	Mylar	0.1	50V	CQMA 104J 50
C8	Mylar	0.1	50V	CQMA 104J 50
C9	Electrolytic	4.7	25V	CSZA 4R7M 25
C10	Ceramic	5600p	50V	CKDYA 562J 50
C11	Ceramic	2700p	50V	CKDYA 272J 50
C12	Electrolytic	10	25V	CSZA 100M 25

12.13 MICROPHONE JACK ASSEMBLY (AWX-097)


1
6
C1 0.0047
R3 39K
C3 0.0027
R1 180K
R5 180K
3
5
C5 0.04
4
R2 180K
C4 0.0027
R6 180K
C2 0.0047
R4 39K
7
2


1
2
3
4
5
6
7
C1 0.0047
R1 180K
R3 39K
R5 180K
C3 0.0027
C5 0.04
R2 180K
C2 0.0047
R4 39K
R6 180K
C4 0.0027
PHONO 2 (R)
PHONO 2 (L)
AWS-094, No.27
AWS-094, No.18
AWS-094, No.21

Parts List of Microphone Jack Assembly (AWX-097)

RESISTORS

Symbol	Description		Part No.
R1	Carbon film	180k	RD¼PS 184JNL
R2	Carbon film	180k	RD¼PS 184JNL
R3	Carbon film	39k	RD¼PS 393JNL
R4	Carbon film	39k	RD¼PS 393JNL
R5	Carbon film	180k	RD¼PS 184JNL
R6	Carbon film	180k	RD¼PS 184JNL

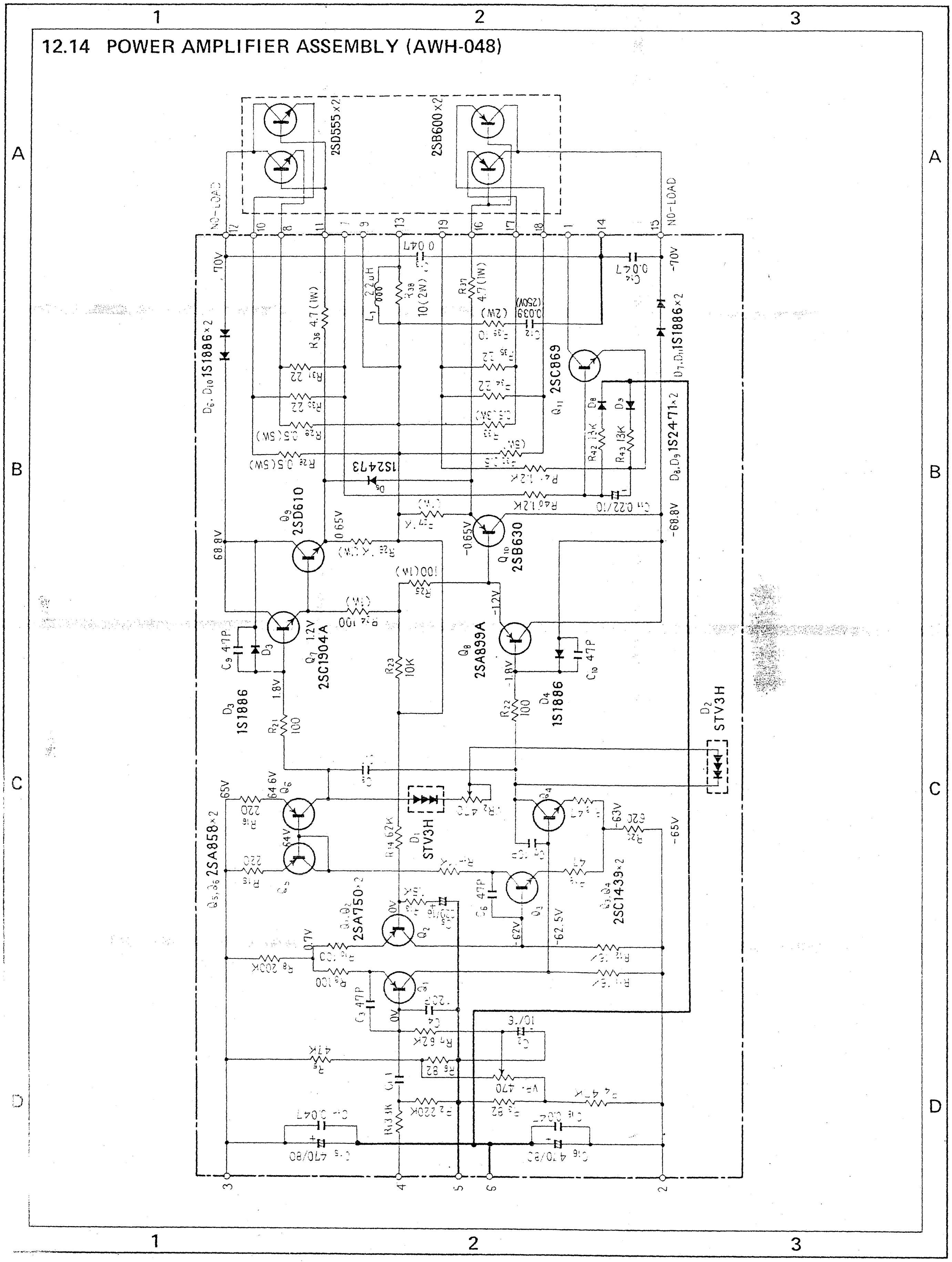
CAPACITORS

Symbol	Description			Part No.
C1	Mylar	4700p	50V	CQMA 472J 50
C2	Mylar	4700p	50V	CQMA 472J 50
C3	Mylar	2700p	50V	CQMA 272J 50
C4	Mylar	2700p	50V	CQMA 272J 50
C5	Ceramic	0.04	50V	CKDYF 403Z 50

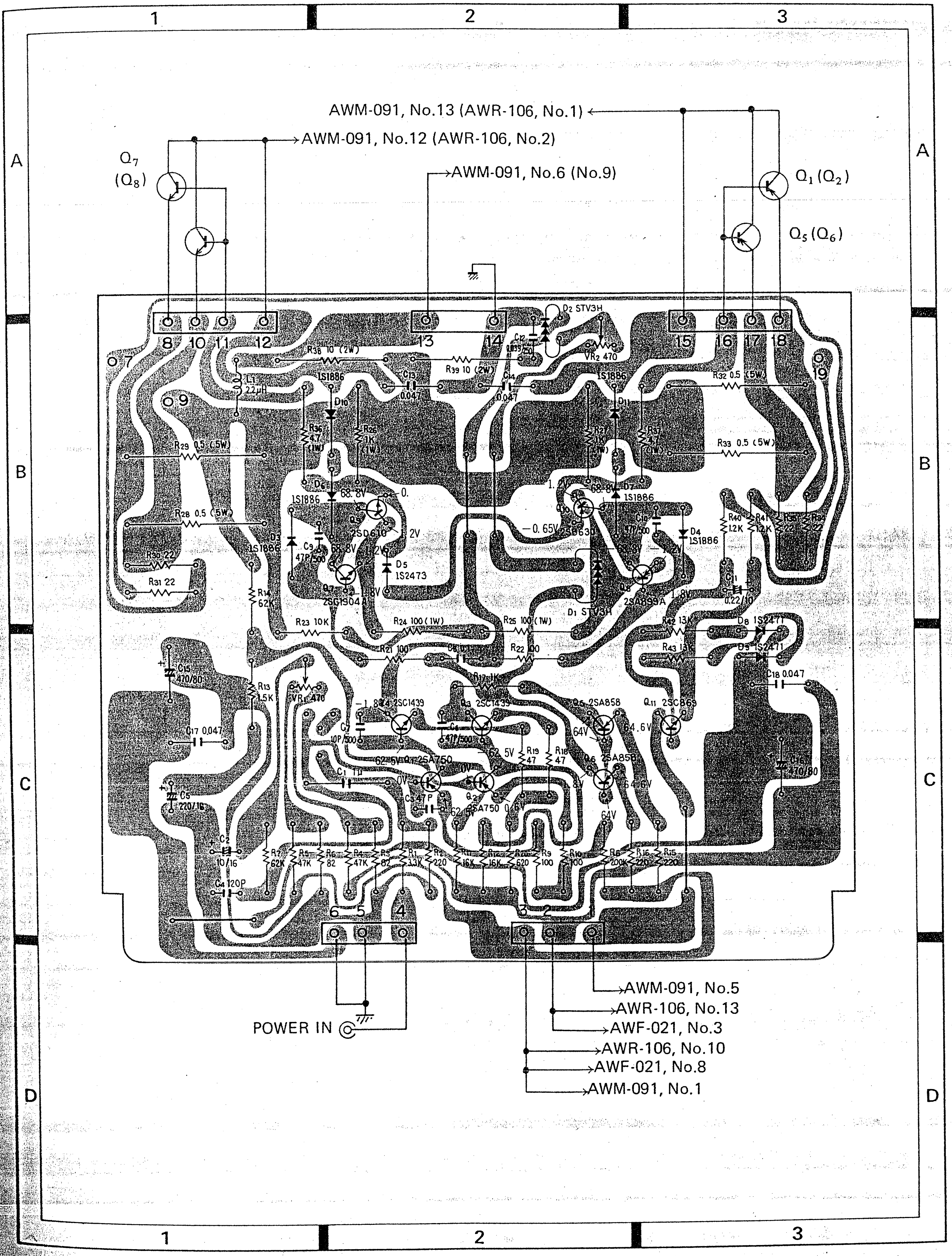
OTHER

Symbol	Description	Part No.
	Phone jack (MIC)	AKN-013

12.14 POWER AMPLIFIER ASSEMBLY (AWH-048)



1
2
3
A
B
C
D
2SD555×2
2SB600×2
NO-LOAD
NO-LOAD
70V
-70V
C13 0.047
C14 0.047
L1 2.2μH
R38 10(2W)
R37 4.7(1W)
R36 4.7(1W)
C12 0.039 (250V)
R39 0.1(2W)
R35 22
R34 22
R31 22
R32 22
R33 0.5(5W)
R28 0.5(5W)
R29 0.5(5W)
R30 0.5(5W)
D6, D10 1S1886×2
D7, D11 1S1886×2
Q11 2SC869
D8
D9
R42 13K
R43 13K
D8, D9 1S2471×2
D5 1S2473
R41 1.2K
R40 1.2K
C11 0.22/10
Q9 2SD610
Q10 2SB630
68.8V
-68.8V
0.65V
-0.65V
R26 1K(1W)
R27 1K(1W)
R25 100(1W)
R24 100(1W)
12V
-12V
Q7 2SC1904A
Q8 2SA899A
C9 47P
C10 47P
D3
D3 1S1886
D4 1S1886
R23 10K
1.8V
-1.8V
R21 100
R22 100
D2 STV3H
D1 STV3H
VR2 470
Q5, Q6 2SA858×2
Q3, Q4 2SC1439×2
Q1, Q2 2SA750×2
65V
64.6V
64V
-63V
-65V
R16 220
R15 220
R14 62K
R20 620
C6 47P
0V
0V
-62V
-62.5V
R10 100
R9 100
R8 200K
R12 15K
R11 15K
C3 47P
C4 20P
C2 10/10
R7 62K
R6 82
R5 47K
VR1 470
R4 4.7K
R3 82
R2 220K
R1 3.3K
C17 0.047
C15 470/80
C16 470/80
C18 0.047
3
4
5
6
2
12
10
8
11
7
9
13
19
16
17
18
1
14
15


1
2
3
A
B
C
D
AWM-091, No.13 (AWR-106, No.1)
AWM-091, No.12 (AWR-106, No.2)
AWM-091, No.6 (No.9)
Q7 (Q8)
Q1 (Q2)
Q5 (Q6)
8
10
11
12
13
14
15
16
17
18
7
9
19
D2 STV3H
VR2 470
R38 10 (2W)
R39 10 (2W)
C12
C13 0.047
C14 0.047
L1 22μH
1S1886
D10
D11
R36 4.7 (1W)
R26 1K (1W)
R27 1K (1W)
R37 4.7 (1W)
R32 0.5 (5W)
R33 0.5 (5W)
R29 0.5 (5W)
R28 0.5 (5W)
R30 22
R31 22
D6
68.8V
Q9 2SD610
1.2V
D3 1S1886
C9 47P/500
Q7 2SC1304A
D5 1S2473
Q10 2SB631
-0.65V
D7 1S1886
C10 47P/500
D4 1S1886
R40 1.2K
R41 1.2K
R35 22
R34 22
D1 STV3H
Q8 2SA899A
C11 0.22/10
R14 62K
R23 10K
R24 100 (1W)
R25 100 (1W)
R42 13K
R43 15K
D8 1S2471
D9 1S2471
R21 100
C8
R22 100
R17 1K
C18 0.047
C15 470/80
R13 1.5K
VR1 470
Q4 2SC1439
Q3 2SC1439
Q5 2SA858
Q11 2SC869
64V
64.6V
C17 0.047
C7 10P/500
C6 47P/500
R19 47
R18 47
Q6 2SA858
C16 470/80
C1 1μ
Q1 2SA750
Q2 2SA750
0V
C3 47P
C5 220/16
C2 10/16
C4 120P
R7 62K
R5 47K
R6 82
R4 47K
R3 82
R1 3.3K
R2 220
R11 16K
R12 16K
R8 620
R9 100
R10 100
R6 200K
R16 22K
R15 220
6
5
4
3
2
1
AWM-091, No.5
AWR-106, No.13
AWF-021, No.3
AWR-106, No.10
AWF-021, No.8
AWM-091, No.1
POWER IN

Parts List of Power Amplifier Assembly (AWH-048)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SA750-E
Q2	Transistor	2SA750-E
Q3	Transistor	2SC1439-B
Q4	Transistor	2SC1439-B
Q5	Transistor	2SA858-B
Q6	Transistor	2SA858-B
Q7	Transistor	2SC1904A-B
Q8	Transistor	2SA899A-B
Q9	Transistor	2SD610-R
Q10	Transistor	2SB630-R
Q11	Transistor	2SC869-C
D1	Varistor	STV-3H
D2	Varistor	STV-3H
D3	Diode	1S1886 (SIB01-02)
D4	Diode	1S1886 (SIB01-02)
D5	Diode	1S2473
D6	Diode	1S1886 (SIB01-02)
D7	Diode	1S1886 (SIB01-02)
D8	Diode	1S2471
D9	Diode	1S2471
D10	Diode	1S1886 (SIB01-02)
D11	Diode	1S1886 (SIB01-02)

Symbol	Description			Part No.
R19	Carbon film	47		RD¼PS 470J
R20	Carbon film	620		RD¼PSF 621J
R21	Carbon film	100		RD¼PSF 101J
R22	Carbon film	100		RD¼PSF 101J
R23	Carbon film	10k		RD¼PS 103J
R24	Metal oxide	100	1W	RS1PF 101J
R25	Metal oxide	100	1W	RS1PF 101J
R26	Metal oxide	1k	1W	RS1PF 102J
R27	Metal oxide	1k	1W	RS1PF 102J
R28	Wire wound	0.5	5W	RT5B 0R5K
R29	Wire wound	0.5	5W	RT5B 0R5K
R30	Carbon film	22		RD¼PSF 220J
R31	Carbon film	22		RD¼PSF 220J
R32	Wire sound	0.5	5W	RT5B 0R5K
R33	Wire wound	0.5	5W	RT5B 0R5K
R34	Carbon film	22		RD¼PSF 220J
R35	Carbon film	22		RD¼PSF 220J
R36	Metal film	4.7	1W	RN1H 4R7K
R37	Metal film	4.7	1W	RN1H 4R7K
R38	Metal oxide	10	2W	RS2P 100J
R39	Metal oxide	10	2W	RS2P 100J
R40	Carbon film	1.2k		RD¼PSF 122J
R41	Carbon film	1.2k		RD¼PSF 122J
R42	Carbon film	13k		RD¼PS 133J
R43	Carbon film	13k		RD¼PS 133J
VR1	Semi-fixed	470-B		ACP-033
VR2	Semi-fixed	470-B		ACP-033

RESISTORS

Symbol	Description		Part No.
R1	Carbon film	3.3k	RD¼PS 332J
R2	Carbon film	220k	RD¼PS 224JNL
R3	Carbon film	82	RD¼PS 820J
R4	Carbon film	47k	RD¼PS 473JNL
R5	Carbon film	47k	RD¼PS 473JNL
R6	Carbon film	82	RD¼PS 820J
R7	Carbon film	62k	RD¼PS 623JNL
R8	Carbon film	200k	RD¼PS 204JNL
9	Carbon film	100	RD¼PS 101J
10	Carbon film	100	RD¼PS 101J
11	Carbon film	16k	RD¼PS 163J
12	Carbon film	16k	RD¼PS 163J
13	Carbon film	1.5k	RD¼PS 152J
14	Carbon film	62k	RD¼PS 623JNL
15	Carbon film	220	RD¼PSF 221J
16	Carbon film	220	RD¼PSF 221J
17	Carbon film	1k	RD¼PSF 102J
18	Carbon film	47	RD¼PS 470J

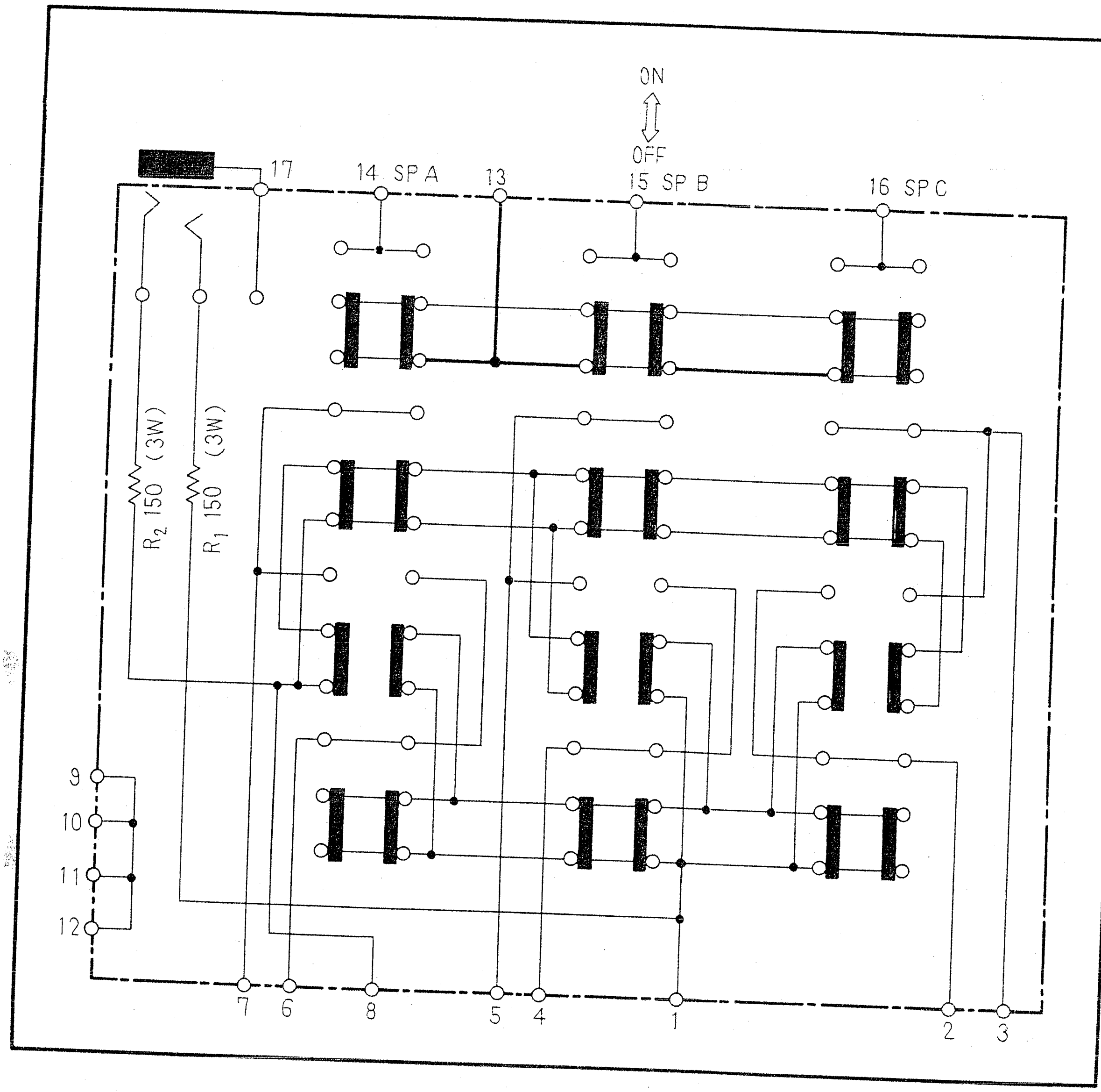
CAPACITORS

Symbol	Description			Part No.
C1	Metallized mylar	1	100V	ACE-008
C2	Electrolytic	10	16V	CEANL 100P 16
C3	Ceramic	47p	50V	CCDSL 470K 50
C4	Ceramic	120p	50V	CCDSL 121K 50
C5	Electrolytic	220	16V	CEANL 221P 16
C6	Ceramic	47p	500V	CCDSL 470K 500
C7	Ceramic	10p	500V	CCDSL 100K 500
C8	Mylar	0.1	50V	CQMA 104J 50
C9	Ceramic	47p	500V	CCDSL 470K 500
C10	Ceramic	47p	500V	CCDSL 470K 500
C11	Electrolytic	0.22	10V	CSZA R22M 10
C12	Mylar	0.039	250V	CQMA 393J 250
C13	Ceramic	0.047	150V	ACG-009
C14	Ceramic	0.047	150V	ACG-009
C15	Electrolytic	470	80V	ACH-038
C16	Electrolytic	470	80V	ACH-038
C17	Ceramic	0.047	150V	ACG-009
C18	Ceramic	0.047	150V	ACG-009

OTHERS

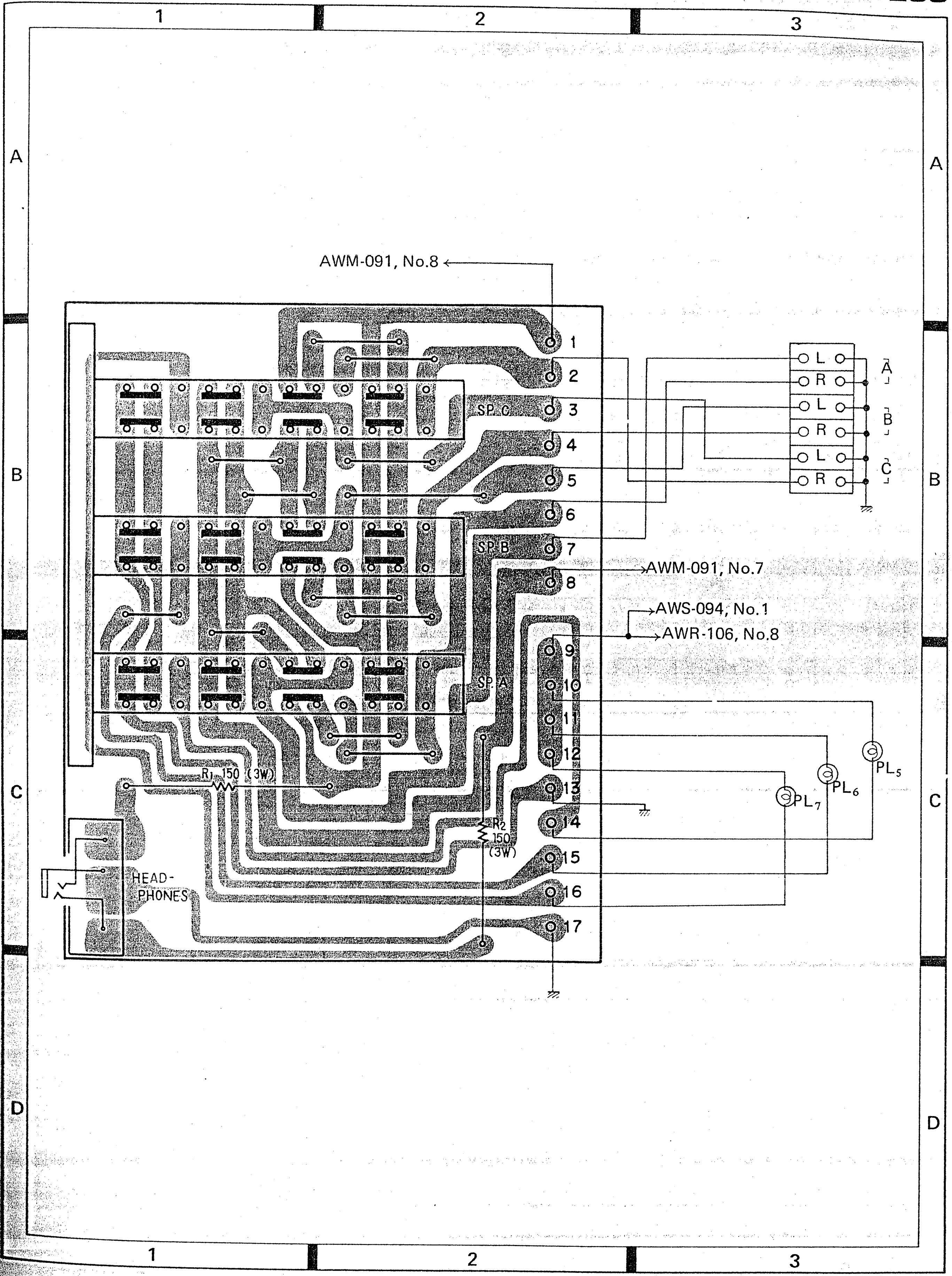
Symbol	Description	Part No.
	Heat sink	ANH-237
L1	AF choke coil 2.2μH	T63-009
	Transistor socket	AKH-002
	Insulator wafer	AEC-088
	Contact strip (3p, L-type)	AKM-024
	Contact strip (4p)	AKM-034
	Contact strip (3p)	AKM-033

12.15 SPEAKERS SWITCH ASSEMBLY (AWS-095)

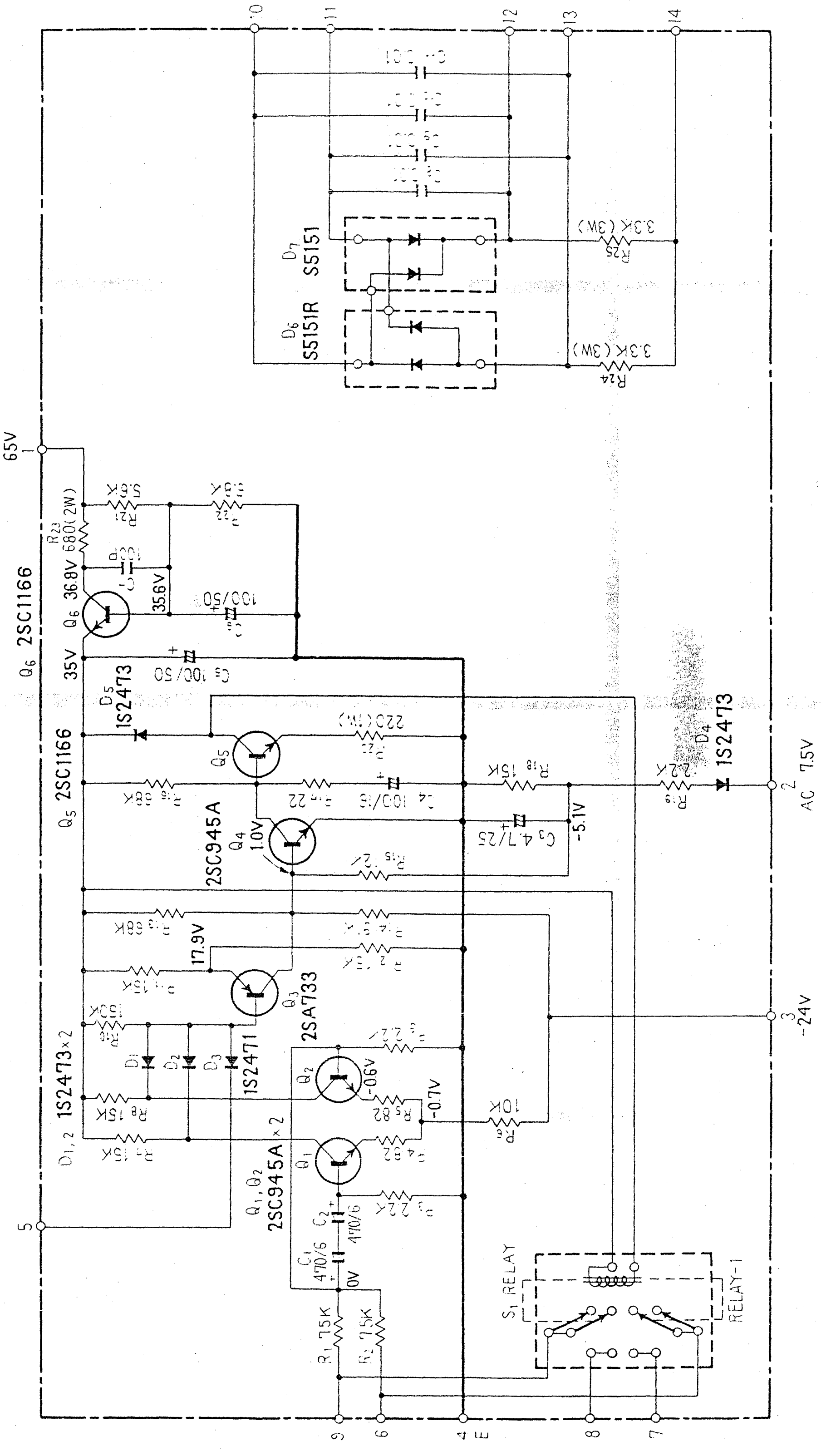

ON
OFF
17
14 SP A
13
15 SP B
16 SP C
R2 150 (3W)
R1 150 (3W)
9
10
11
12
7
6
8
5
4
1
2
3

rts List of Speakers Switch Assembly (AWS-095)

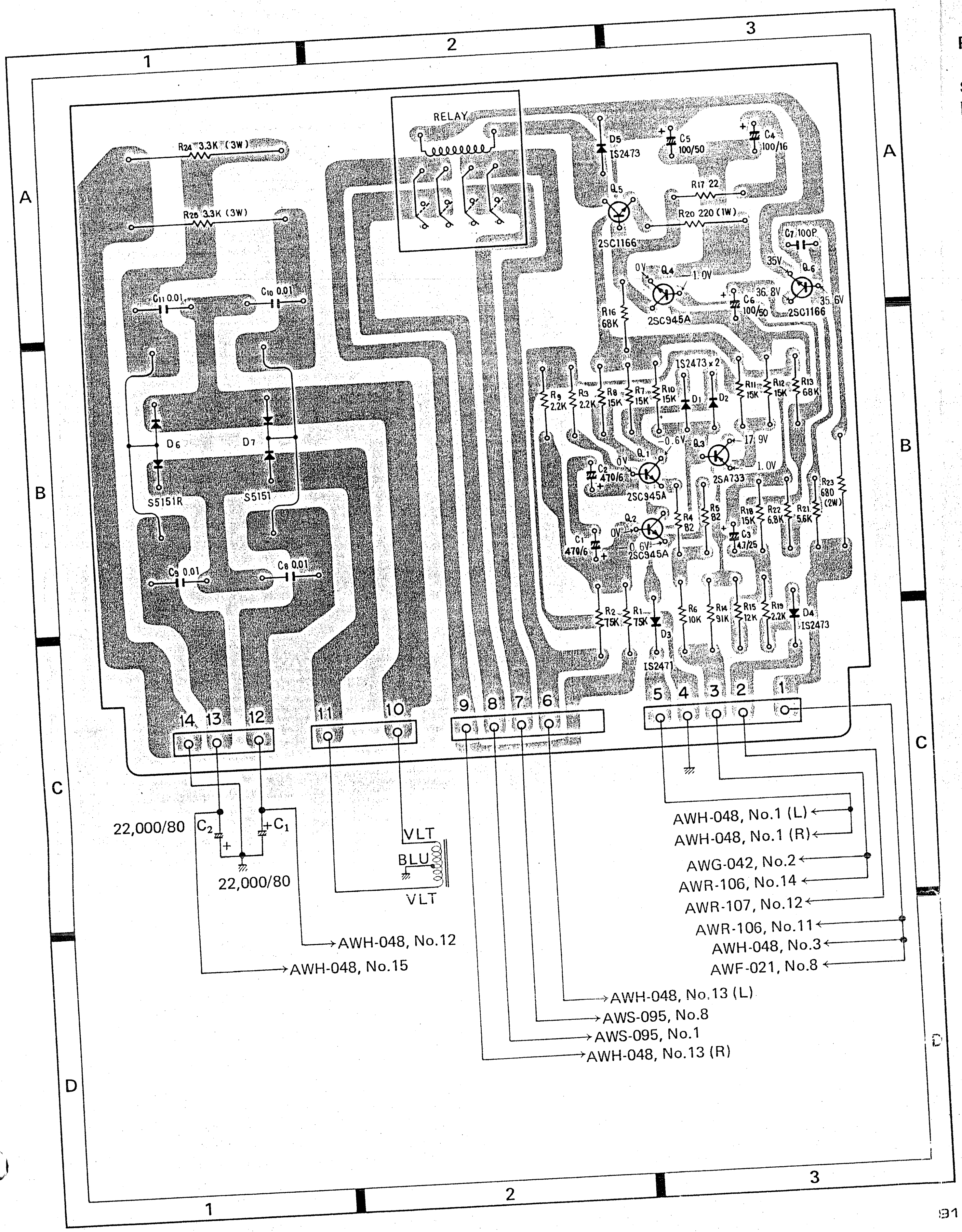
mbol	Description			Part No.
S1	Push switch (SPEAKERS)			ASG-094
R1	Metal oxide resistor	150	3W	RS3P 151K
R2	Metal oxide resistor	150	3W	RS3P 151K
1	Phone jack (PHONES)			AKN-010


1
2
3
A
B
C
D
AWM-091, No.8
1
2
SP.C
3
4
5
6
SP.B
7
8
AWM-091, No.7
AWS-094, No.1
AWR-106, No.8
9
SP.A
10
11
12
13
14
15
16
17
L
R
L
R
L
R
A
B
C
PL$_5$
PL$_6$
PL$_7$
R$_1$ 150 (3W)
R$_2$ 150 (3W)
HEAD-PHONES

12.16 PROTECTION CIRCUIT ASSEMBLY (AWM-091)


10
11
12
13
14
C10 .001
C11 .001
C9 .001
C8 .001
D7 S5151
D6 S5151R
R25 3.3K (3W)
R24 3.3K (3W)
65V 1
R21 5.6K
R22 3.3K
R23 680(2W)
C7 100P
Q6 2SC1166
36.8V
35.6V
C6 100/50
35V
C5 100/50
D5 1S2473
Q5 2SC1166
R17 220(1W)
R16 68K
R14 22
C4 100/16
R18 15K
R19 2.2K
D4 1S2473
2 AC 7.5V
Q4 2SC945A
1.0V
C3 4.7/25
-5.1V
R15 12K
R13 68K
R14 6.8K
17.9V
R12 13K
R11 15K
Q3 2SA733
R10 150K
D1 D2 D3 1S2471
D1,2 1S2473×2
R9 2.2K
Q2
-0.6V
R8 15K
R5 82
-0.7V
R6 10K
3 -24V
R7 15K
Q1
R4 82
Q1, Q2 2SC945A×2
R3 2.2K
C2 470/6
C1 470/6
0V
5
S1 RELAY
RELAY-1
R1 7.5K
R2 7.5K
9
6
4 E
8
7

A
B
C
D
A
B
C
D
1
2
3


RELAY
R24 3.3K (3W)
R25 3.3K (3W)
C11 0.01
C10 0.01
D6
D7
S5151R
S5151
C9 0.01
C8 0.01
D5
1S2473
C5 100/50
C4 100/16
R17 22
Q5
R20 220 (1W)
2SC1166
C7 100P
35V
Q6
0V
Q4
1.0V
36.8V
C6 100/50
35.6V
2SC1166
R16 68K
2SC945A
1S2473 x 2
R9 2.2K
R3 2.2K
R8 15K
R7 15K
R10 15K
D1
D2
R11 15K
R12 15K
R13 68K
0.6V
Q3
17.9V
Q1
C2 470/6
2SA733
1.0V
2SC945A
R23 680 (2W)
Q2
0V
R4 82
R5 82
R18 15K
R22 6.8K
R21 5.6K
C3 4.7/25
C1 470/6
0.6V
2SC945A
R2 75K
R1 75K
D3
1S2471
R6 10K
R14 91K
R15 12K
R19 2.2K
D4
1S2473
14
13
12
11
10
9
8
7
6
5
4
3
2
1
22,000/80
C2
C1
22,000/80
VLT
BLU
VLT
AWH-048, No.1 (L)
AWH-048, No.1 (R)
AWG-042, No.2
AWR-106, No.14
AWR-107, No.12
AWR-106, No.11
AWH-048, No.3
AWF-021, No.8
AWH-048, No.12
AWH-048, No.15
AWH-048, No.13 (L)
AWS-095, No.8
AWS-095, No.1
AWH-048, No.13 (R)
A
B
C
D

Parts List of Protection Circuit Assembly (AWM-091)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SC945A-Q (2SC1647-P)
Q2	Transistor	2SC945A-Q (2SC1647-P)
Q3	Transistor	2SA733-Q
Q4	Transistor	2SC945A-Q (2SC1647-P)
Q5	Transistor	2SC1166-Y (2SC1384-Q)
Q6	Transistor	2SC1166-Y (2SC1384-Q)
D1	Diode	1S2473
D2	Diode	1S2473
D3	Diode	1S2471
D4	Diode	1S2473
D5	Diode	1S2473
D6	Diode	S5151R
D7	Diode	S5151

CAPACITORS

Symbol	Description			Part No.
C1	Electrolytic	470	6V	CEA 471P 6
C2	Electrolytic	470	6V	CEA 471P 6
C3	Electrolytic	4.7	25V	CEA 4R7P 25
C4	Electrolytic	100	16V	CEA 101P 16
C5	Electrolytic	100	50V	CEA 101P 50
C6	Electrolytic	100	50V	CEA 101P 50
C7	Ceramic	100p	50V	CCDSL 101K 50
C8	Ceramic	0.01	150V	ACG-004
C9	Ceramic	0.01	150V	ACG-004
C10	Ceramic	0.01	150V	ACG-004
C11	Ceramic	0.01	150V	ACG-004

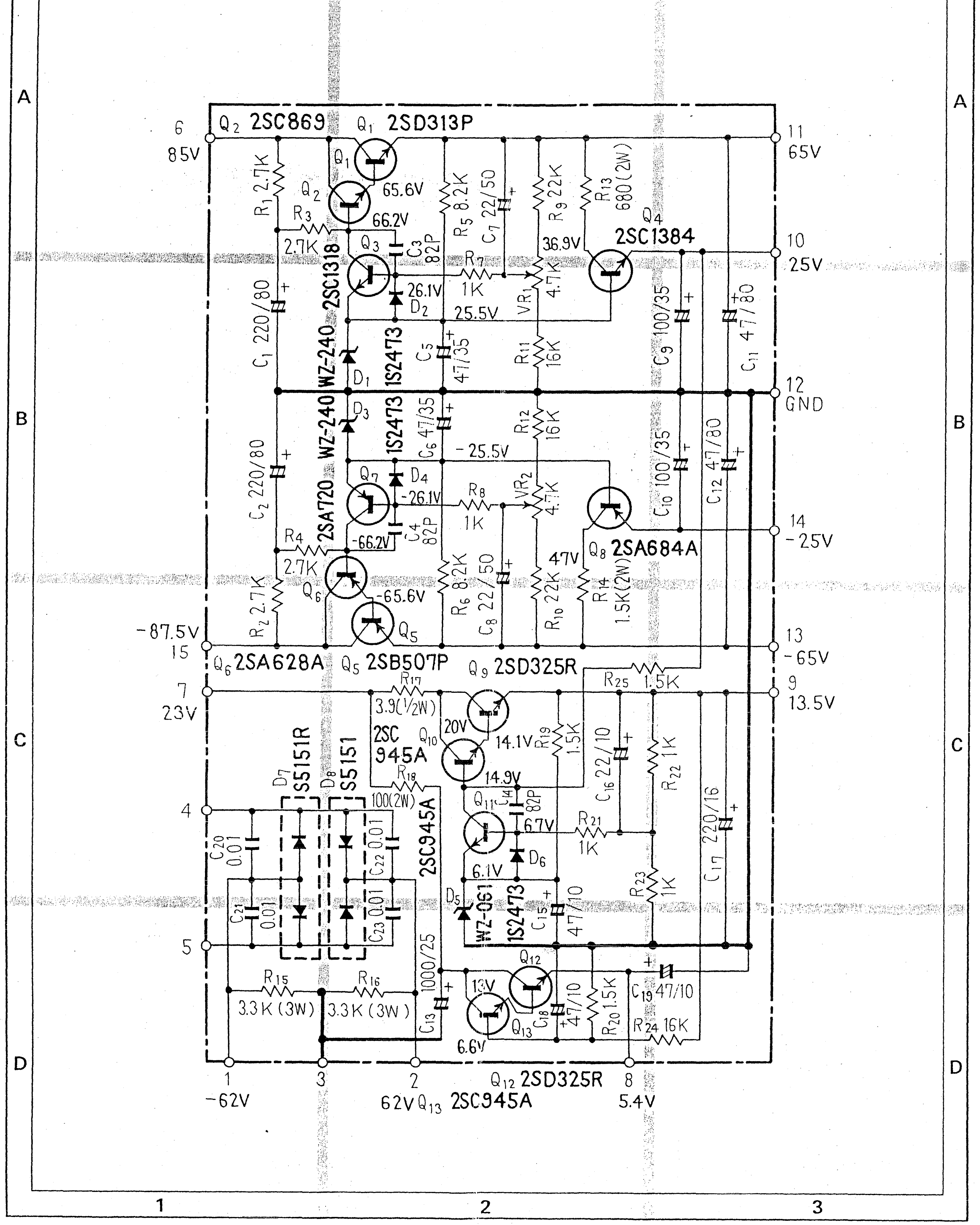
OTHERS

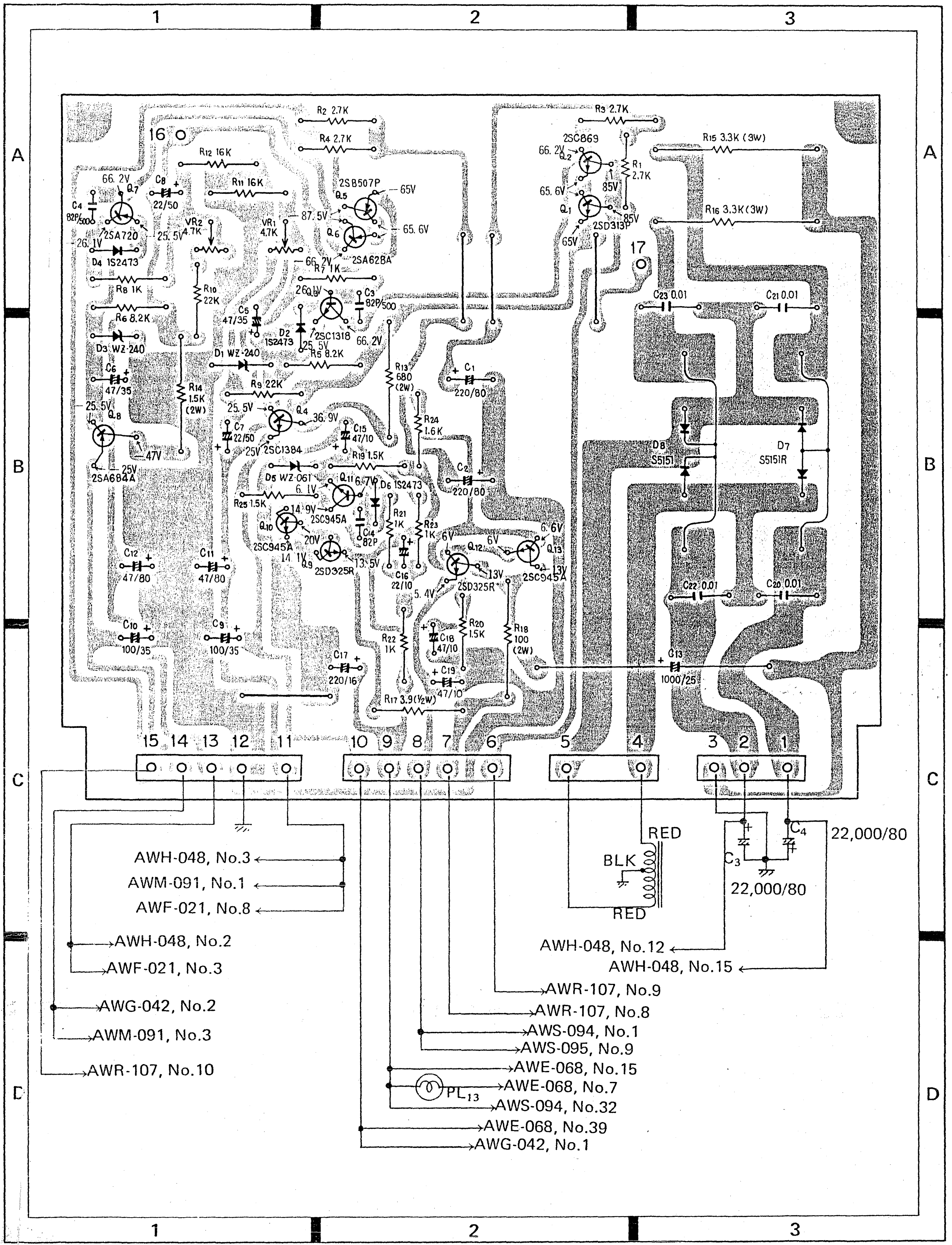
Symbol	Description	Part No.
S1	Relay	ASR-010
	Contact strip (3p, L-type)	AKM-024
	Contact strip (5p, L-type)	AKM-025

RESISTORS

Symbol	Description			Part No.
R1	Carbon film	75k		RD¼PS 753J
R2	Carbon film	75k		RD¼PS 753J
R3	Carbon film	2.2k		RD¼PS 222J
R4	Carbon film	82		RD¼PS 820J
R5	Carbon film	82		RD¼PS 820J
R6	Carbon film	10k		RD¼PS 103J
R7	Carbon film	15k		RD¼PS 153J
R8	Carbon film	15k		RD¼PS 153J
R9	Carbon film	2.2k		RD¼PS 222J
R10	Carbon film	150k		RD¼PS 154J
R11	Carbon film	15k		RD¼PS 153J
R12	Carbon film	15k		RD¼PS 153J
R13	Carbon film	68k		RD¼PS 683J
R14	Carbon film	91k		RD¼PS 913J
R15	Carbon film	12k		RD¼PS 123J
R16	Carbon film	68k		RD¼PS 683J
R17	Carbon film	22		RD¼PS 220J
R18	Carbon film	15k		RD¼PS 153J
R19	Carbon film	2.2k		RD¼PS 222J
R20	Metal oxide	220	1W	RS1P 211J
R21	Carbon film	5.6k		RD¼PS 562J
R22	Carbon film	6.8k		RD¼PS 682J
R23	Metal oxide	680	2W	RS2P 681J
R24	Metal oxide	3.3k	3W	RS3P 332K
R25	Metal oxide	3.3k	3W	RS3P 332K

12.17 STABILIZER ASSEMBLY (AWR-106)


Q2 2SC869
Q1 2SD313P
6
85V
11
65V
R1 2.7K
R3 2.7K
65.6V
66.2V
Q3 2SC1318
C3 82P
R5 8.2K
C7 22/50
R9 22K
R13 680 (2W)
Q4 2SC1384
36.9V
26.1V
D2
R7 1K
25.5V
VR1 4.7K
10
25V
C1 220/80
D1 WZ-240
1S2473
C5 47/35
R11 16K
C9 100/35
C11 47/80
12
GND
C2 220/80
D3 WZ-240
1S2473
C6 47/35
-25.5V
R12 16K
C10 100/35
C12 47/80
Q7 2SA720
D4
-26.1V
R8 1K
VR2 4.7K
Q8 2SA684A
14
-25V
R4 2.7K
-66.2V
C4 82P
47V
Q6
-65.6V
R2 2.7K
R6 8.2K
C8 22/50
R10 22K
R14 1.5K (2W)
Q5
-87.5V
15
13
-65V
Q6 2SA628A
Q5 2SB507P
Q9 2SD325R
R25 1.5K
7
23V
R17 3.9 (1/2W)
9
13.5V
2SC 945A
Q10
20V
14.1V
R19 1.5K
C16 22/10
R22 1K
D7 S5151R
D8 S5151
R18 100 (2W)
14.9V
4
C20 0.01
C22 0.01
2SC945A
Q11
C14 82P
6.7V
R21 1K
D6
6.1V
R23 1K
C17 220/16
C21 0.01
C23 0.01
D5 WZ-061
1S2473
C15 47/10
5
R15 3.3K (3W)
R16 3.3K (3W)
C13 1000/25
13V
Q12
C19 47/10
C18 47/10
R20 1.5K
R24 16K
Q13
6.6V
1
-62V
3
2
62V
Q13 2SC945A
Q12 2SD325R
8
5.4V
1 2 3
A B C D


1 2 3
A B C D
16
17
R2 2.7K
R4 2.7K
R12 16K
R11 16K
R3 2.7K
R1 2.7K
R15 3.3K (3W)
R16 3.3K (3W)
2SC869
2SD313P
2SB507P
2SA628A
2SA720
2SC1318
2SC1384
2SA684A
2SC945A
2SD325R
1S2473
WZ-240
WZ-061
S5151
S5151R
C23 0.01
C21 0.01
C22 0.01
C20 0.01
C13 1000/25
C17 220/16
15 14 13 12 11
10 9 8 7 6
5 4
3 2 1
RED
BLK
RED
22,000/80
C3
C4
22,000/80
AWH-048, No.3
AWM-091, No.1
AWF-021, No.8
AWH-048, No.2
AWF-021, No.3
AWG-042, No.2
AWM-091, No.3
AWR-107, No.10
AWH-048, No.12
AWH-048, No.15
AWR-107, No.9
AWR-107, No.8
AWS-094, No.1
AWS-095, No.9
AWE-068, No.15
PL13
AWE-068, No.7
AWS-094, No.32
AWE-068, No.39
AWG-042, No.1

Parts List of Stabilizer Assembly (AWR-106)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	Transistor	2SD313P-E
Q2	Transistor	2SC869-D
Q3	Transistor	2SC1318-R
Q4	Transistor	2SC1384-R
Q5	Transistor	2SB507P-E
Q6	Transistor	2SA628A-D
Q7	Transistor	2SA720-R
Q8	Transistor	2SA684A-R
Q9	Transistor	2SD325R-E
Q10	Transistor	2SC945A-R
Q11	Transistor	2SC945A-R
Q12	Transistor	2SD325R-E
Q13	Transistor	2SC945A-R
D1	Zener diode	WZ-240
D2	Diode	1S2473
D3	Zener diode	WZ-240
D4	Diode	1S2473
D5	Zener diode	WZ-061
D6	Diode	1S2473
D7	Diode	S5151R
D8	Diode	S5151

RESISTORS

Symbol	Description			Part No.
R1	Carbon film	2.7k		RD¼PSF 272J
R2	Carbon film	2.7k		RD¼PSF 272J
R3	Carbon film	2.7k		RD¼PS 272J
R4	Carbon film	2.7k		RD¼PS 272J
R5	Carbon film	8.2k		RD¼PS 822J
R6	Carbon film	8.2k		RD¼PS 822J
R7	Carbon film	1k		RD¼PS 102J
R8	Carbon film	1k		RD¼PS 102J
R9	Carbon film	22k		RD¼PS 223J
R10	Carbon film	22k		RD¼PS 223J
R11	Carbon film	16k		RD¼PS 163J
R12	Carbon film	16k		RD¼PS 163J
R13	Metal oxide	680	2W	RS2P 681K
R14	Metal oxide	1.5k	2W	RS2P 152K
R15	Metal oxide	3.3k	3W	RS3P 332K
R16	Metal oxide	3.3k	3W	RS3P 332K
R17	Carbon film	3.9	½W	RD½PSF 3R9J
R18	Metal oxide	100	2W	RS2P 101K
R19	Carbon film	1.5k		RD¼PS 152J
R20	Carbon film	1.5k		RD¼PS 152J
R21	Carbon film	1k		RD¼PS 102J
R22	Carbon film	1k		RD¼PS 102J
R23	Carbon film	1k		RD¼PS 102J
R24	Carbon film	1.6k		RD¼PS 162J
R25	Carbon film	1.5k		RD¼PS 152J
VR1	Semi-fixed	4.7k-B		ACP-034
VR2	Semi-fixed	4.7k-B		ACP-034

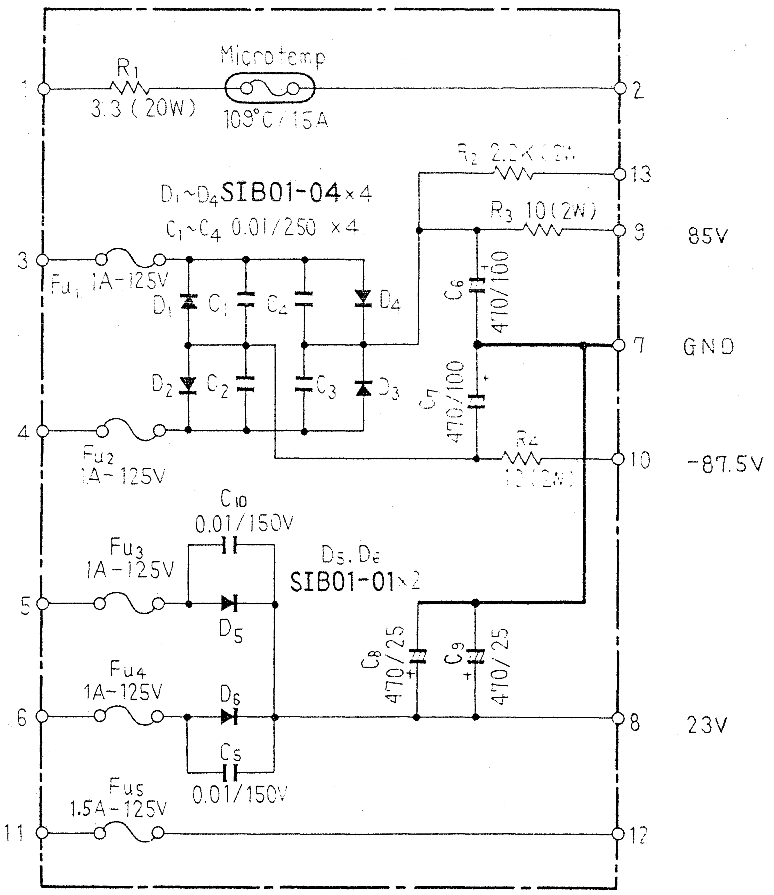
CAPACITORS

Symbol	Description			Part No.
C1	Electrolytic	220	80V	CEA 221P 80
C2	Electrolytic	220	80V	CEA 221P 80
C3	Ceramic	82p	500V	CCDSL 820K 500
C4	Ceramic	82p	500V	CCDSL 820K 500
C5	Electrolytic	47	35V	CEA 470P 35
C6	Electrolytic	47	35V	CEA 470P 35
C7	Electrolytic	22	50V	CEA 220P 50
C8	Electrolytic	22	50V	CEA 220P 50
C9	Electrolytic	100	35V	CEA 101P 35
C10	Electrolytic	100	35V	CEA 101P 35
C11	Electrolytic	47	80V	CEA 470P 80
C12	Electrolytic	47	80V	CEA 470P 80
C13	Electrolytic	1000	25V	CEB 102P 25
C14	Ceramic	82p	50V	CCDSL 820K 50
C15	Electrolytic	47	10V	CEA 470P 10
C16	Electrolytic	22	10V	CEA 220P 10
C17	Electrolytic	220	16V	CEA 221P 16
C18	Electrolytic	47	10V	CEA 470P 10
C19	Electrolytic	47	10V	CEA 470P 10
C20	Ceramic	0.01	150V	ACG-004
C21	Ceramic	0.01	150V	ACG-004
C22	Ceramic	0.01	150V	ACG-004
C23	Ceramic	0.01	150V	ACG-004

OTHERS

Symbol	Description	Part No.
	Heat sink	ANH-237
	Heat sink	ANH-300
	Transistor socket	AKH-002
	Insulator wafer	ACE-088
	Contact strip (3p, L-type)	AKM-024
	Contact strip (5p, L-type)	AKM-025

POWER SUPPLY ASSEMBLY (AWR-107)



R1
3.3 (20W)
Microtemp
109°C/15A
R2 2.2K(2W)
R3 10(2W)
D1~D4 SIB01-04×4
C1~C4 0.01/250 ×4
Fu1 1A-125V
D1
C1
C4
D4
D2
C2
C3
D3
C6 470/100
C7 470/100
R4 10(2W)
Fu2 1A-125V
C10 0.01/150V
Fu3 1A-125V
D5, D6 SIB01-01×2
D5
C8 470/25
C9 470/25
Fu4 1A-125V
D6
C5 0.01/150V
Fu5 1.5A-125V
1
2
3
4
5
6
7
8
9
10
11
12
13
85V
GND
-87.5V
23V

List of Power Supply Assembly (AWR-107)

ICONDUCTORS

bol	Description	Part No.
1	Diode	SIB01-04
2	Diode	SIB01-04
3	Diode	SIB01-04
4	Diode	SIB01-04
5	Diode	SIB01-01 (1S1885)
6	Diode	SIB01-01 (1S1885)

STORS

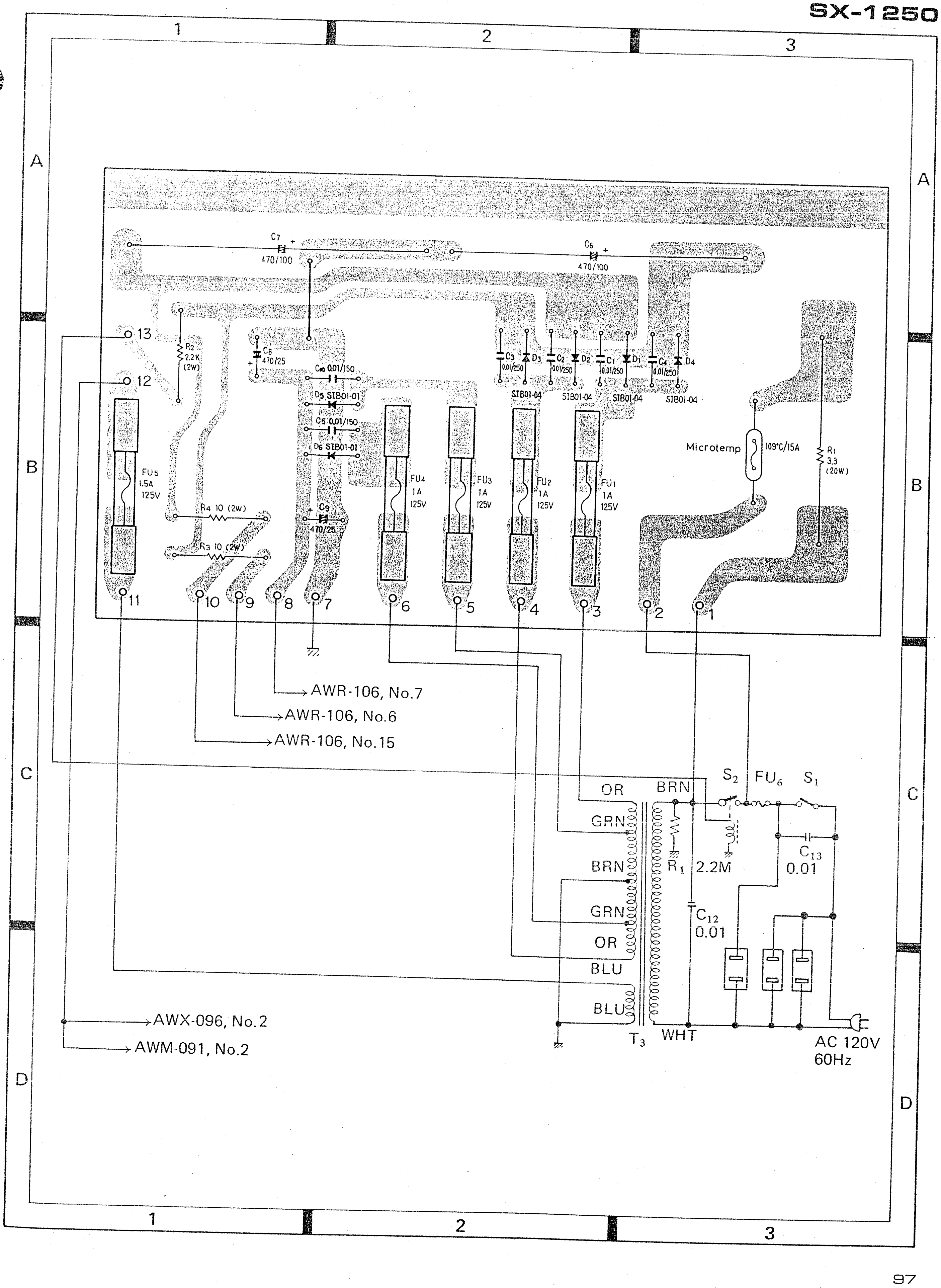
bol	Description			Part No.
	Wire wound	3.3	20W	ACN-003
	Metal oxide	2.2K	2W	RS2P 222J
	Metal oxide	10	2W	RS2P 100K
	Metal oxide	10	2W	RS2P 100K

CAPACITORS

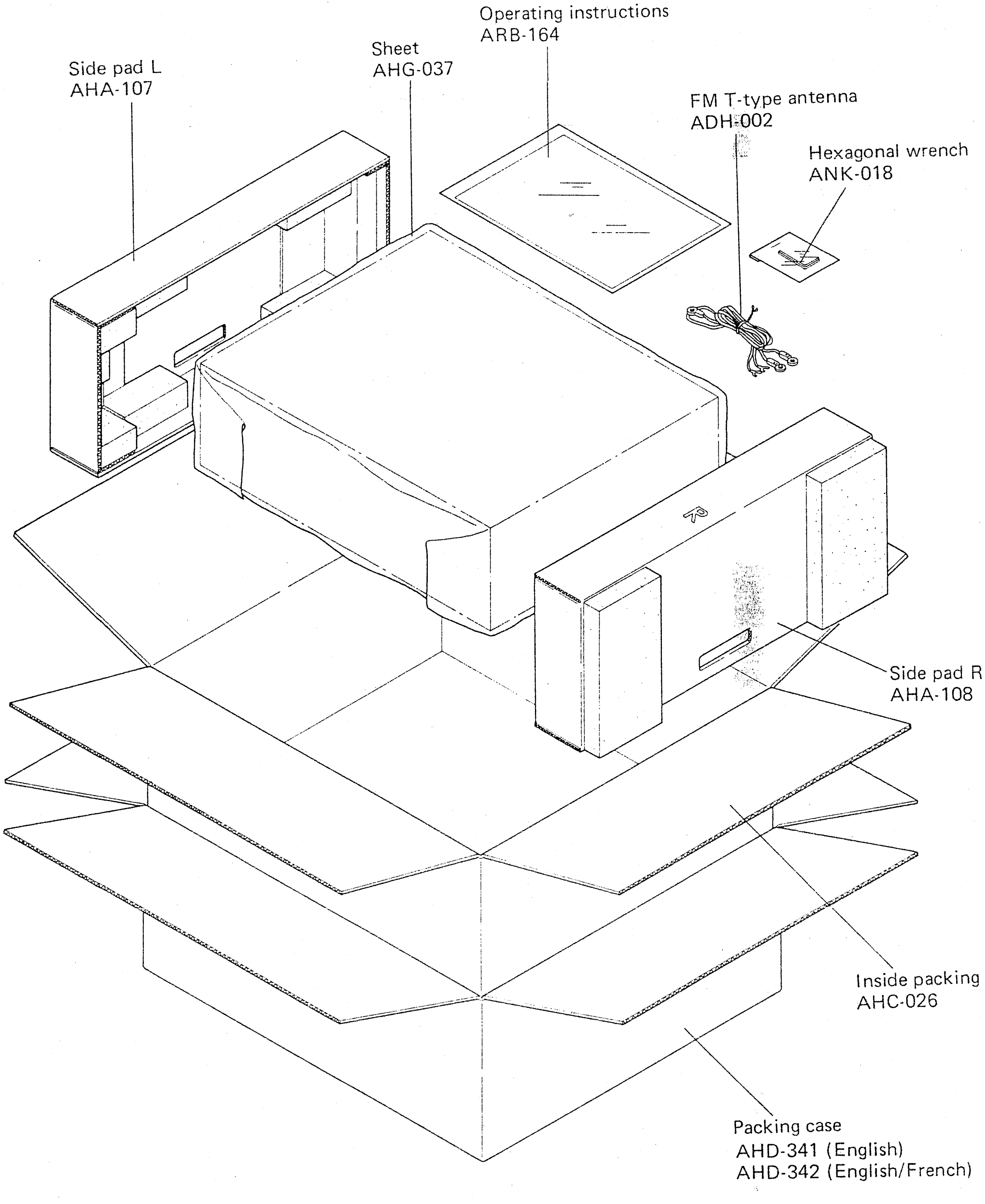
Symbol	Description			Part No.
C1	Ceramic	0.01	250V	ACG-001
C2	Ceramic	0.01	250V	ACG-001
C3	Ceramic	0.01	250V	ACG-001
C4	Ceramic	0.01	250V	ACG-001
C5	Ceramic	0.01	150V	ACG-004
C6	Electrolytic	470	100V	CEB 471P 100
C7	Electrolytic	470	100V	CEB 471P 100
C8	Electrolytic	470	25V	CEA 471P 25
C9	Electrolytic	470	25V	CEA 471P 25
C10	Ceramic	0.01	150V	ACG-004

OTHERS

Symbol	Description	Part No.
	Fuse clip	AKR-013
	Fuse clip	AKR-030
	MICROTEMP	AEX-005


1
2
3
A
B
C
D
C7 470/100
C6 470/100
13
12
R2 2.2K (2W)
C8 470/25
C10 0.01/150
D5 SIB01-01
C5 0.01/150
D6 SIB01-01
C9 470/25
C3 0.01/250
D3
C2 0.01/250
D2
C1 0.01/250
D1
C4 0.01/250
D4
SIB01-04
SIB01-04
SIB01-04
SIB01-04
FU5 1.5A 125V
FU4 1A 125V
FU3 1A 125V
FU2 1A 125V
FU1 1A 125V
Microtemp
109°C/15A
R1 3.3 (20W)
R4 10 (2W)
R3 10 (2W)
11
10
9
8
7
6
5
4
3
2
1
AWR-106, No.7
AWR-106, No.6
AWR-106, No.15
OR
GRN
BRN
GRN
OR
BLU
BLU
BRN
R1 2.2M
C12 0.01
S2
FU6
S1
C13 0.01
T3
WHT
AC 120V 60Hz
AWX-096, No.2
AWM-091, No.2

13. PACKING


Operating instructions
ARB-164
Sheet
AHG-037
Side pad L
AHA-107
FM T-type antenna
ADH-002
Hexagonal wrench
ANK-018
R
Side pad R
AHA-108
Inside packing
AHC-026
Packing case
AHD-341 (English)
AHD-342 (English/French)

14. PARTS LIST OF EXPLODED VIEWS

Parts No.	Parts Name
AAA-034	Knob
AAB-100	Knob
AAB-104	Knob
AAD-113	Knob
AAD-114	Knob
AAF-051	Dial Pointer
AAG-106	Dial Scale Plate
AAP-037	Blind Sash
AAT-025	Shaft Cover
AAT-026	Indicator
AAT-027	Indicator
AAT-028	Indicator
AAW-040	Double Meter
ABA-002	Screw
ABA-012	Screw
ABA-081	Screw
ABA-087	Screw
ABA-113	Screw
ABA-114	Pulley Shaft
ABA-116	Screw
ABA-123	Screw
ABA-129	Screw
ABE-006	Washer
ABE-018	Washer
ABH-022	Coil Spring
ABN-021	Nut
ABN-022	Panel Base
ABN-023	Washer Faced Nut
ABN-024	Washer Faced Nut
ACG-001	Capacitor (HG, S)
ACG-003	Capacitor (KCU)
ACH-056	Capacitor
ACV-163	Variable Resistor
ACV-165	Variable Resistor
ACV-166	Variable Resistor
ACV-167	Variable Resistor
ACV-168	Variable Resistor
ACV-169	Variable Resistor
ADG-013	AC Power Cord (KCU)
ADG-015	AC Power Cord (S)
ADH-002	FM Antenna
ADX-029	Cable Housing
ADX-030	Cable Housing
ADX-031	Cable Housing
ADX-032	Cable Housing
ADX-033	Cable Housing
ADX-034	Cable Housing
ADX-035	Cable Housing
ADX-036	Cable Housing
ADX-037	Cable Housing

Parts No.	Parts Name
ADX-038	Cable Housing
ADX-039	Cable Housing
AEB-085	Rubber Bracket A
AEB-086	Rubber Bracket B
AEB-087	Rubber Spacer
AEC-076	Insulator Wafer
AEC-079	Strain Relief
AEC-101	Pulley
AEC-151	Wire Supporter
AEC-178	Foot
AEC-256	Pulley
AEC-258	Spacer
AEC-272	Acrylic Board
AED-018	Mask
AEK-104	Fuse (1.5A) (KCU, S)
AEK-106	Fuse (1A) (KCU, S)
AEK-109	Fuse (6A) (S)
AEK-301	Fuse (12A) (KCU, S)
AEK-402	Fuse (1A) (HG)
AEK-404	Fuse (6.3A) (HG)
AEK-405	Fuse (1.6A) (HG)
AEL-056	Lamp Ass
AEL-069	Lamp
AEL-072	Lamp
AEL-073	Lamp
AEL-074	Lamp
AEL-075	Lamp
AEL-076	Lamp
AHA-107	Side Pad L
AHA-108	Side Pad R
AHC-026	Inner Packing
AHD-341	Packing Case (KU, S, HG)
AHD-342	Packing Case (KC)
AHG-037	Sheet
AKA-004	Terminal
AKB-019	Terminal
AKB-030	Terminal
AKB-033	Terminal
AKC-030	Terminal Strip 2P
AKC-038	Terminal Strip 2P
AKE-012	Terminal
AKE-014	Terminal
AKF-053	Connecting Plate
AKH-001	Transistor Socket
AKN-010	Phone Jack
AKN-013	Phone Jack
AKP-005	AC Socket (KCU, S)
AKP-007	5P Connector Socket
AKP-008	AC Socket (HG)
AKR-028	Fuse Holder 1P

Parts No.	Parts Name
AKR-031	Plug in Selector
AKX-031	Plug in Selector
AMM-049	Wooden Cover
ANB-386	Front Panel Ass
ANE-105	Top Panel
ANK-018	Hexagonal Wrench
ARB-164	Operating Instruction
ARB-168	Operating Instruction
ARB-171	Operating Instruction
ARD-089	Operating Instruction
ASG-094	Push Switch
ASG-095	Push Switch
ASG-098	Push Switch
ASH-015	Slide Switch
ASK-080	Power Switch (KCU)
ASK-084	Lever Switch
ASK-090	Lever Switch
ASK-092	Lever Switch
ASK-099	Power Switch (S)
ASK-105	Power Switch (HG)
ASR-015	Relay
ATB-051	Ferrite Bar Antenna
ATT-267	Power Trans (KCU)
ATT-291	Power Trans (S)
ATT-295	Power Trans (HF)
AWB-023	FM Front End
AWE-068	Tuner Ass
AWF-021	EQ Amp Ass
AWG-041	Control Amp Ass
AWG-042	Flat Amp Ass
AWH-048	Power Amp Ass
AWM-089	Filter Amp Ass
AWM-091	Protection Ass
AWR-106	Stabilizer Ass
AWR-107	Power Supply Ass
AWR-108	Power Supply Ass
AWS-094	Function Switch Ass
AWS-095	Speaker Switch Ass
AWS-098	Speaker Switch Ass
AWX-062	5P Connector Ass
AWX-096	Lamp Board Ass
AWX-097	Mic Jack Ass
AWX-099	Switch Ass (KCU)
AWX-100	Switch Ass (S)
AXA-070	Tuning Drum Ass
AXA-111	Tuning Shaft Ass
B71-004	Nut
B71-010	Nut
M45-086	Washer
T22-025	Ferrite Balun

Parts No.	Parts Name
W72-092	Bar Antenna Holder
2SD555-R	Transistor
2SB600R	Transistor

15. SUPPLEMENTS FOR SX-1250/HG AND SX-1250/S

For servicing of the SX-1250/HG or S please refer to pp.4–100, with the exception of the power supply section and the de-emphasis selector which are described in this supplement.

15.1 CONTRAST OF MISCELLANEOUS-PARTS

FUSES

Symbol	Amp	Part No.			Remarks
		KCU type	HG type	S type	
FU1-4	1A	AEK-106	AEK-402	AEK-106	Secondary
FU5	1.5A	AEK-104	....	AEK-104	Lamp circuits
	1.6A	....	AEK-405	....	
FU6	12A	AEK-301	....	AEK-301	Primary voltage : 110V, 120V
	6.3A	....	AEK-404	....	Primary voltage : 220V, 240V
	6A	....	....	AEK-109	Primary voltage : 220V, 240V

SWITCHES

Symbol	Part Name	Part No.			Remarks
		KCU type	HG type	S type	
S1	Lever switch	ASK-080	ASK-105	ASK-099	POWER
S3	Plug in selector	....	AKX-037	....	2-position
	(Line voltage selector)	....	....	AKR-031	4-position with fuse holder

TRANSFORMER

Symbol	Part Name	Part No.			Remarks
		KCU type	HG type	S type	
T3	Power Transformer	ATT-267	ATT-295	ATT-291	

RESISTOR

Symbol	Part Name	Part No.			Remarks
		KCU type	HG type	S type	
R1	Carbon film 2.2M ½W	RD½PS 225J	....	....	

CAPACITORS

Symbol	Part Name	Part No.			Remarks
		KCU type	HG type	S type	
C12	Ceramic 0.01 150V	ACG-003	....	....	DC1.4kV
	Ceramic 0.01 250V	....	ACG-001	ACG-001	
C13	Ceramic 0.01 150V	ACG-003	....	....	DC1.4kV
	Ceramic 0.01 250V	....	....	ACG-001	
C15	Polystyrene 510p 50V	....	CQSA511J50	....	
C16	Polystyrene 510p 50V	....	CQSA511J50	....	
C17	Ceramic 56p 50V	....	CCDSL560K50	....	

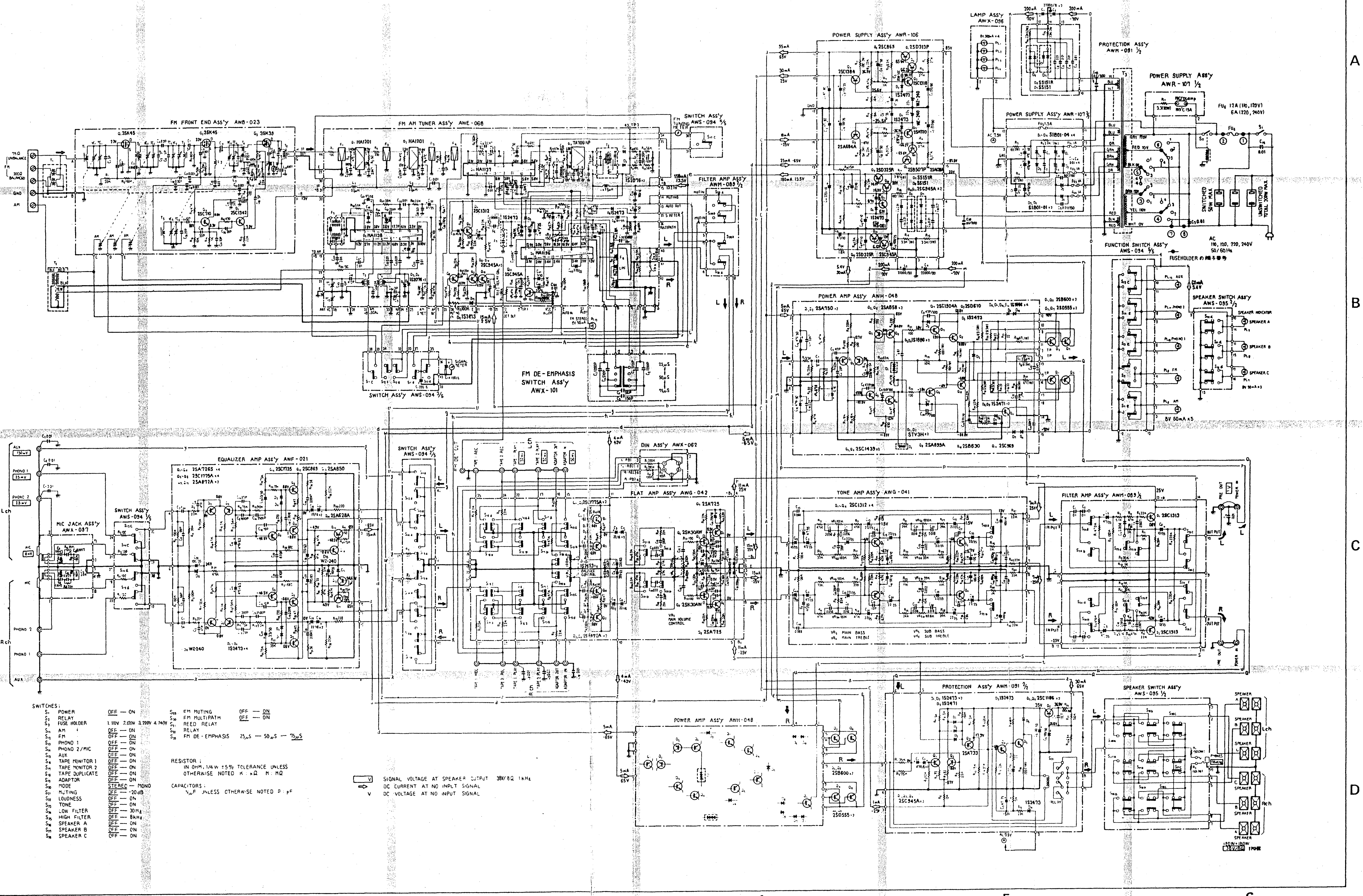
P.C. BOARD ASSEMBLIES

Part Name	Part No.			Remarks
	KCU type	HG type	S type	
De-emphasis switch assembly	AWX-099	....	.... AWX-101	2-position (25μs/75μs) 3-position (25μs/50μs/75μs)
Power supply assembly	AWR-107	AWR-108	AWR-107	
Speakers switch assembly	AWS-095	AWS-098	AWS-095	

THERS

Part Name	Part No.			Remarks
	KCU type	HG type	S type	
AC power cord	ADG-013	....	ADG-015	
AC socket (OUTLET) AC socket (INLET)	AKP-005	.... AKP-008	AKP-005	
Operating instructions	ARB-164	ARB-171 ARD-089	ARB-168	English German/French

15.2 SCHEMATIC DIAGRAM FOR SX-1250/S


FM FRONT END ASS'Y AWB-023
FM AM TUNER ASS'Y AWE-068
SWITCH ASS'Y AWS-094 5/5
FILTER AMP ASS'Y AWM-083 1/2
SWITCH ASS'Y AWS-094 3/5
FM DE-EMPHASIS SWITCH ASS'Y AWX-101
POWER SUPPLY ASS'Y AWR-106
LAMP ASS'Y AWX-086
PROTECTION ASS'Y AWM-091 1/2
POWER SUPPLY ASS'Y AWR-107 1/2
POWER SUPPLY ASS'Y AWR-107 2/2
FUNCTION SWITCH ASS'Y AWS-034 4/5
SPEAKER SWITCH ASS'Y AWS-035 2/2
POWER AMP ASS'Y AWH-048
EQUALIZER AMP ASS'Y AWF-021
MIC JACK ASS'Y AWX-087
SWITCH ASS'Y AWS-094 1/5
SWITCH ASS'Y AWS-094 2/5
DIN ASS'Y AWX-062
FLAT AMP ASS'Y AWG-042
TONE AMP ASS'Y AWG-041
FILTER AMP ASS'Y AWM-083 1/2
PROTECTION ASS'Y AWM-091 2/2
SPEAKER SWITCH ASS'Y AWS-035 1/2
POWER AMP ASS'Y AWH-048
AUX
PHONO 1
PHONO 2
MIC
Lch
Rch
SPEAKER A
SPEAKER B
SPEAKER C
AC 110, 120, 220, 240V 50/60Hz
1 2 3 4 5 6
A B C D

SWITCHES ;

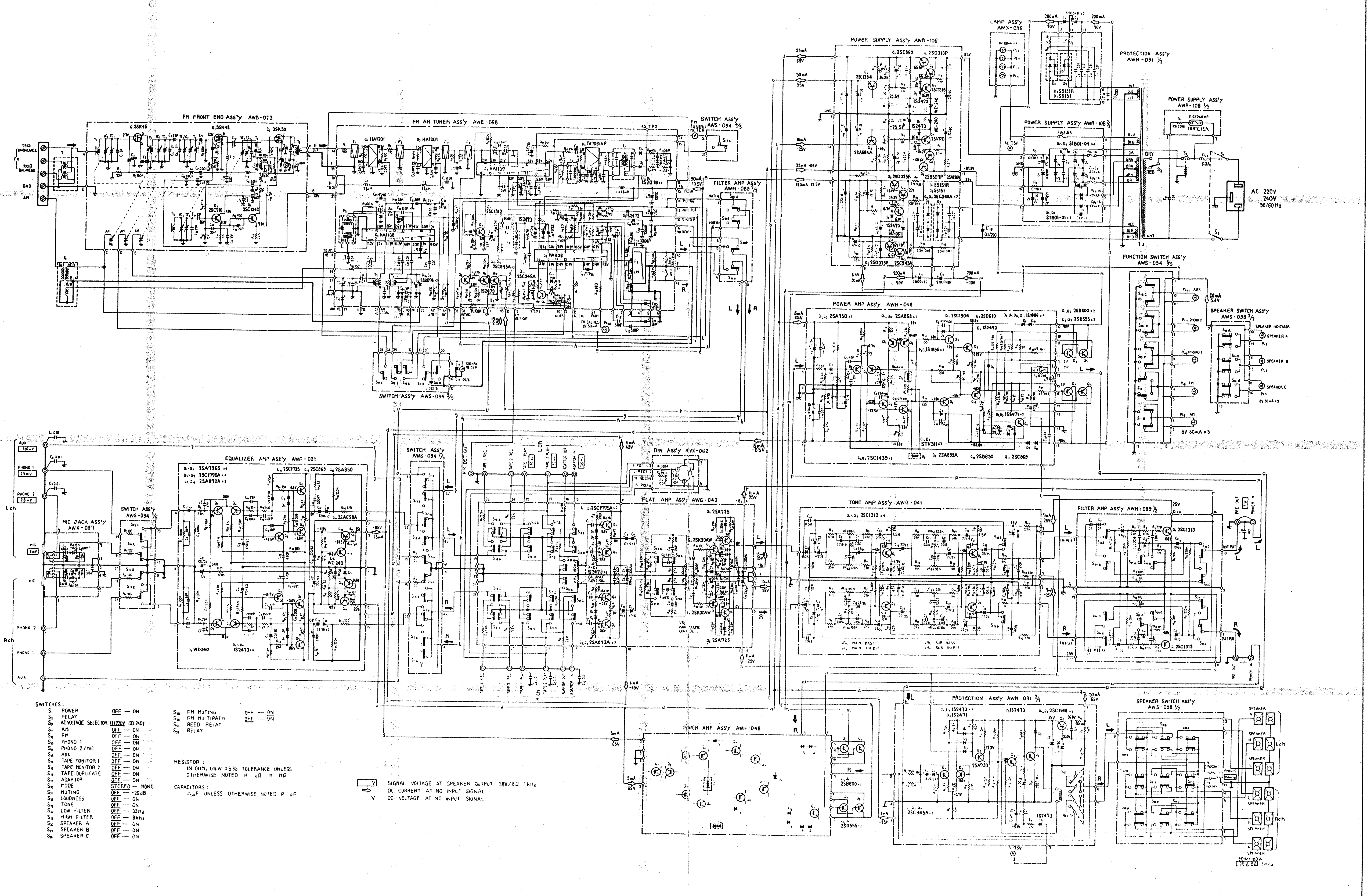
S_1	POWER	OFF — ON		S_{29}	FM MUTING	OFF — ON
S_2	RELAY			S_{30}	FM MULTIPATH	OFF — ON
S_3	FUSE HOLDER	1. 110V 2. 120V 3. 220V 4. 240V		S_{31}	REED RELAY	
S_{11}	AM	OFF — ON		S_{32}	RELAY	
S_{12}	FM	OFF — ON		S_{33}	FM DE-EMPHASIS	25μS — 50μS — 75μS
S_{13}	PHONO 1	OFF — ON				
S_{14}	PHONO 2/MIC	OFF — ON				
S_{15}	AUX	OFF — ON				
S_{16}	TAPE MONITOR 1	OFF — ON				
S_{17}	TAPE MONITOR 2	OFF — ON				
S_{18}	TAPE DUPLICATE	OFF — ON				
S_{19}	ADAPTOR	OFF — ON				
S_{20}	MODE	STEREO — MONO				
S_{21}	MUTING	OFF — -20dB				
S_{22}	LOUDNESS	OFF — ON				
S_{23}	TONE	OFF — ON				
S_{24}	LOW FILTER	OFF — 30Hz				
S_{25}	HIGH FILTER	OFF — 8kHz				
S_{26}	SPEAKER A	OFF — ON				
S_{27}	SPEAKER B	OFF — ON				
S_{28}	SPEAKER C	OFF — ON				

RESISTOR ;
IN OHM, 1/4W ±5% TOLERANCE UNLESS
OTHERWISE NOTED K : kΩ M : MΩ

CAPACITORS ;
N μF UNLESS OTHERWISE NOTED P : pF

V	SIGNAL VOLTAGE AT SPEAKER OUTPUT 38V/8Ω 1kHz
⇨	DC CURRENT AT NO INPUT SIGNAL
V	DC VOLTAGE AT NO INPUT SIGNAL

15.3 SCHEMATIC DIAGRAM FOR SX-1250/HG


1
2
3
4
5
6
A
B
C
D
FM FRONT END ASS'Y AWE-023
FM AM TUNER ASS'Y AWE-068
SWITCH ASS'Y AWS-094 5/5
FILTER AMP ASS'Y AWH-083 1/2
POWER SUPPLY ASS'Y AWR-106
LAMP ASS'Y AWX-036
PROTECTION ASS'Y AWM-091 1/2
POWER SUPPLY ASS'Y AWR-108 1/2
POWER SUPPLY ASS'Y AWR-108 2/2
AC 220V 240V 50/60Hz
FUNCTION SWITCH ASS'Y AWS-094 3/5
SPEAKER SWITCH ASS'Y AWS-098 1/2
POWER AMP ASS'Y AWH-048
SWITCH ASS'Y AWS-094 4/5
EQUALIZER AMP ASS'Y AWF-021
MIC JACK ASS'Y AWX-037
SWITCH ASS'Y AWS-094 1/5
SWITCH ASS'Y AWS-094 2/5
DIN ASS'Y AWX-062
FLAT AMP ASS'Y AWG-042
TONE AMP ASS'Y AWG-041
FILTER AMP ASS'Y AWH-083 1/2
PROTECTION ASS'Y AWM-091 1/2
SPEAKER SWITCH ASS'Y AWS-098 1/2
Lch
Rch
PHONO 1
PHONO 2
AUX
MIC

SWITCHES ;

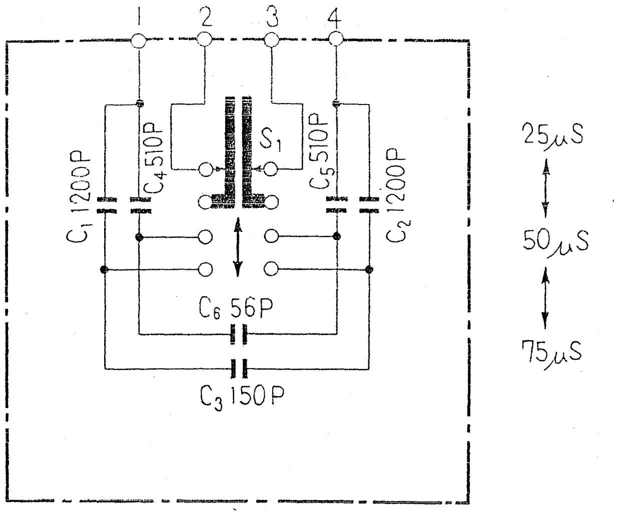
S1	POWER	OFF — ON
S2	RELAY	
S3	AC VOLTAGE SELECTOR	(1) 220V (2) 240V
S11	AM	OFF — ON
S12	FM	OFF — ON
S13	PHONO 1	OFF — ON
S14	PHONO 2/MIC	OFF — ON
S15	AUX	OFF — ON
S16	TAPE MONITOR 1	OFF — ON
S17	TAPE MONITOR 2	OFF — ON
S18	TAPE DUPLICATE	OFF — ON
S19	ADAPTOR	OFF — ON
S20	MODE	STEREO — MONO
S21	MUTING	OFF — -20dB
S22	LOUDNESS	OFF — ON
S23	TONE	OFF — ON
S24	LOW FILTER	OFF — 30Hz
S25	HIGH FILTER	OFF — 8kHz
S26	SPEAKER A	OFF — ON
S27	SPEAKER B	OFF — ON
S28	SPEAKER C	OFF — ON
S29	FM MUTING	OFF — ON
S30	FM MULTIPATH	OFF — ON
S31	REED RELAY	
S32	RELAY	

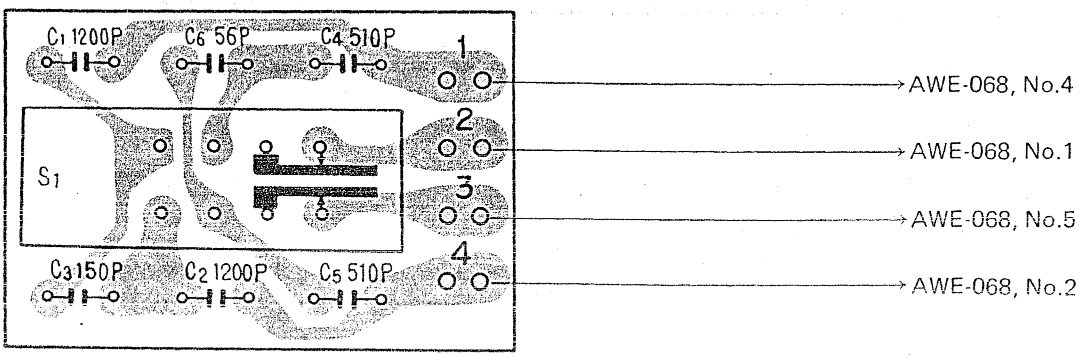
RESISTOR ;
IN OHM, 1/4W ±5% TOLERANCE UNLESS OTHERWISE NOTED K : kΩ M : MΩ

CAPACITORS ;
IN μF UNLESS OTHERWISE NOTED P : pF

▭V	SIGNAL VOLTAGE AT SPEAKER OUTPUT 38V/8Ω 1kHz
⇨	DC CURRENT AT NO INPUT SIGNAL
V	DC VOLTAGE AT NO INPUT SIGNAL

15.4 DE-EMPHASIS SWITCH ASSEMBLY (AWX-101, for S type)

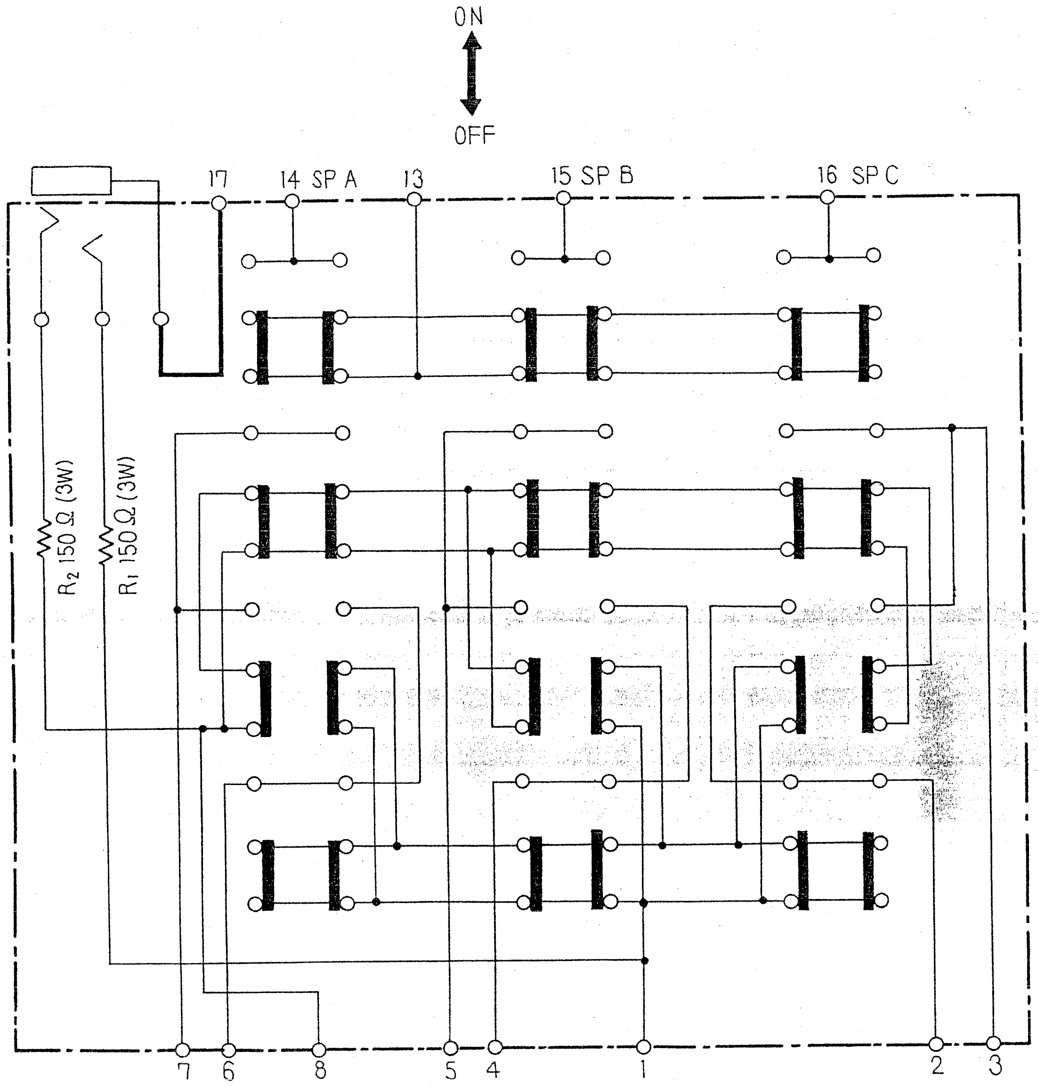

1
2
3
4
C1 1200P
C4 510P
S1
C5 510P
C2 1200P
C6 56P
C3 150P
25µS
50µS
75µS


C1 1200P
C6 56P
C4 510P
1
2
3
4
S1
C3 150P
C2 1200P
C5 510P
AWE-068, No.4
AWE-068, No.1
AWE-068, No.5
AWE-068, No.2

Parts List of De-emphasis Switch Assembly (AWX-101, for S type)

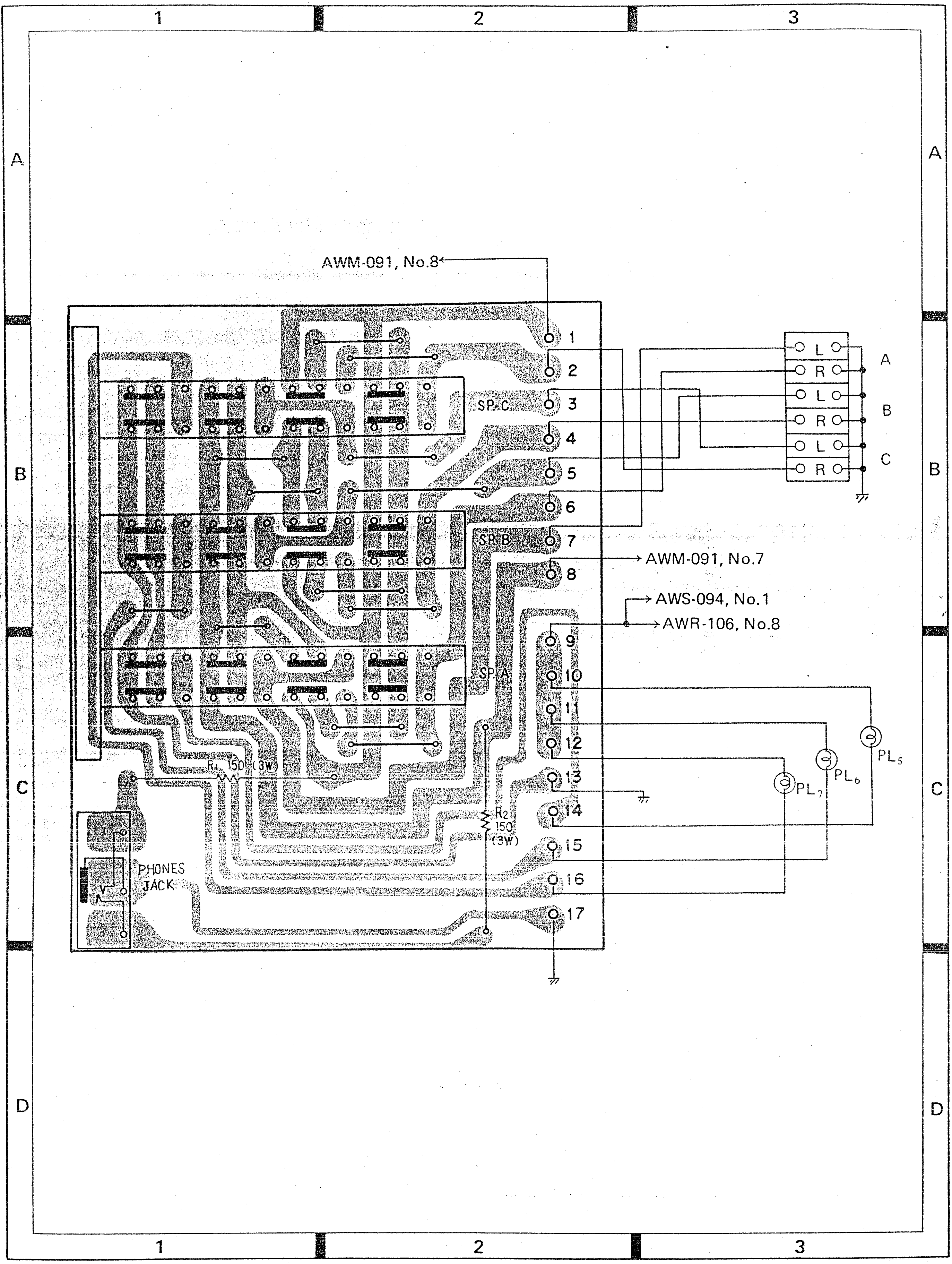
Symbol	Description			Part No.
S1	Slide switch (DE-EMPHASIS)			ASH-017
C1	Ceramic	1200p	50V	CKDYA 122J 50
C2	Ceramic	1200p	50V	CKDYA 122J 50
C3	Ceramic	150p	50V	CCDSL 151K 50
C4	Polystyrene	510p	50V	CQSA 511J 50
C5	Polystyrene	510p	50V	CQSA 511J 50
C6	Ceramic	56p	50V	CCDSL 560K 50

15.5 SPEAKERS SWITCH ASSEMBLY (AWS-098, for HG type)

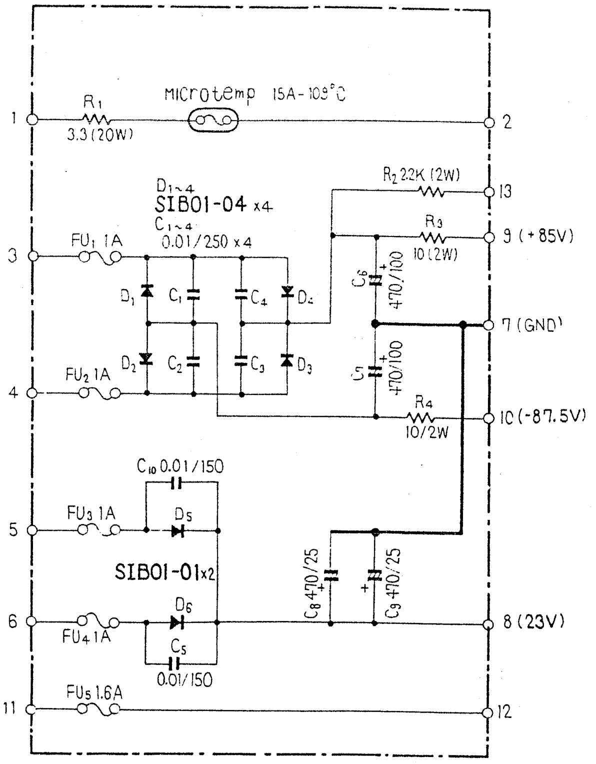

ON
OFF
17
14 SP A
13
15 SP B
16 SP C
R₂ 150 Ω (3W)
R₁ 150 Ω (3W)
7
6
8
5
4
1
2
3

Parts List of Speaker Switch Assembly (AWS-098, for HG type)

Symbol	Description	Part No.
S1	Push switch (SPEAKERS)	ASG-100
R1	Metal oxide resistor 150 3W	RS3P 151K
R2	Metal oxide resistor 150 3W	RS3P 151K
	Phone jack (PHONES)	AKN-010


1
2
3
A
B
C
D
AWM-091, No.8
AWM-091, No.7
AWS-094, No.1
AWR-106, No.8
SP. C
SP. B
SP. A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
L
R
L
R
L
R
A
B
C
PL5
PL6
PL7
R1 150 (3W)
R2 150 (3W)
PHONES JACK

15.6 POWER SUPPLY ASSEMBLY (AWR-108, for HG type)


R1
3.3(20W)
MICrotemp 15A-109°C
1
2
R2 2.2K (2W)
13
D1~4
SIB01-04 x4
C1~4
0.01/250 x4
FU1 1A
3
R3
10(2W)
9 (+85V)
D1
C1
C4
D4
C6
470/100
7 (GND)
FU2 1A
D2
C2
C3
D3
C7
470/100
4
R4
10/2W
10 (-87.5V)
C10 0.01/150
FU3 1A
D5
5
SIB01-01x2
C8 470/25
C9 470/25
D6
6
FU4 1A
C5
0.01/150
8 (23V)
FU5 1.6A
11
12

Parts List of Power Supply Assembly (AWR-108, for HG type)

EMICONDUCTORS

Symbol	Description	Part No.
D1	Diode	SIB01-04
D2	Diode	SIB01-04
D3	Diode	SIB01-04
D4	Diode	SIB01-04
D5	Diode	SIB01-01 (IS1885)
D6	Diode	SIB01-01 (IS1885)

ESISTORS

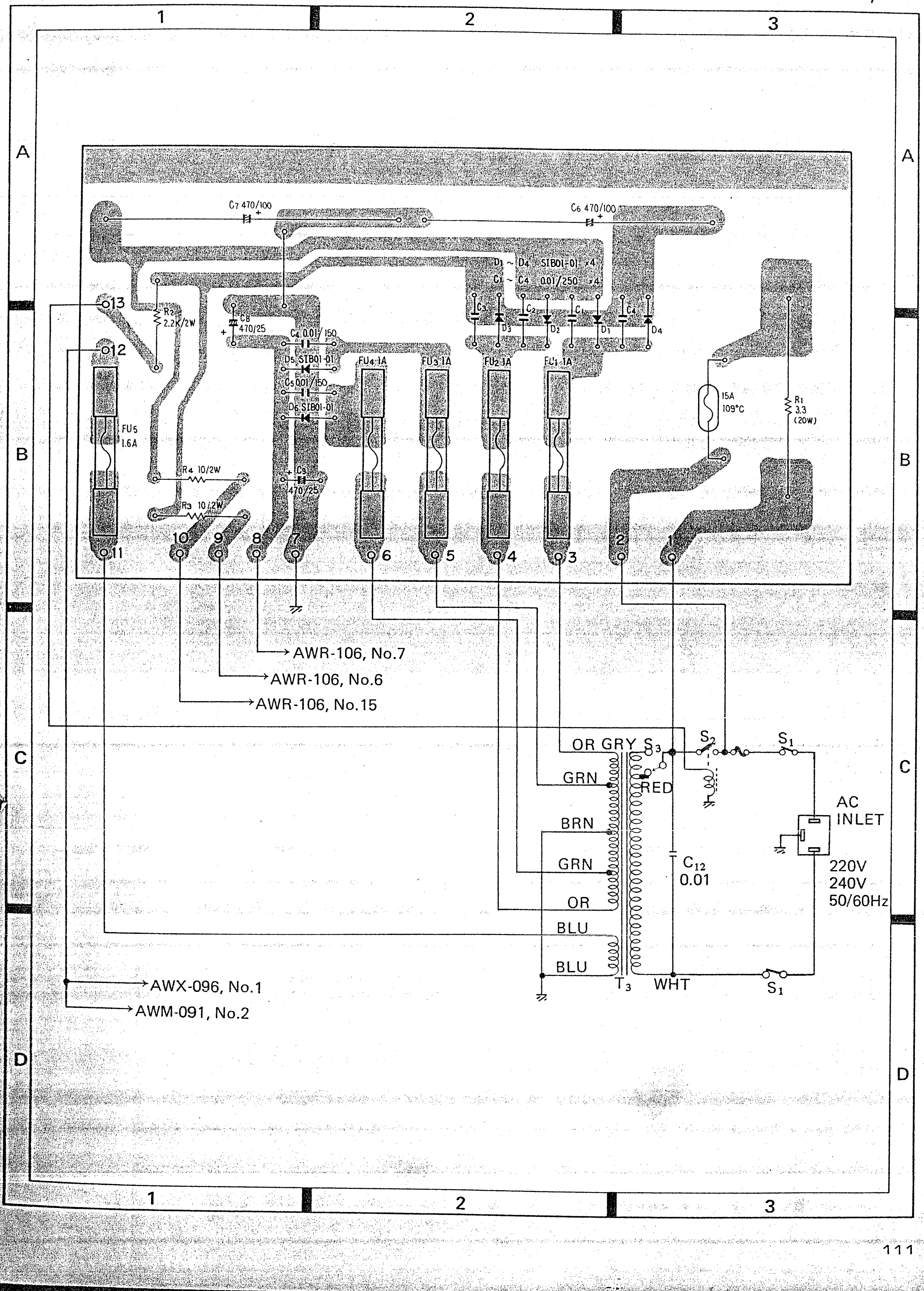
Symbol	Description			Part No.
R1	Wire wound	3.3	20W	ACN-003
R2	Metal oxide	2.2k	2W	RS2P 222J
R3	Metal oxide	10	2W	RS2P 100K
R4	Metal oxide	10	2W	RS2P 100K

CAPACITORS

Symbol	Description			Part No.
C1~C4	Ceramic	0.01	250V	ACG-001
C5	Ceramic	0.01	150V	ACG-004
C6	Electrolytic	470	100V	CEB 471P 100
C7	Electrolytic	470	100V	CEB 471P 100
C8	Electrolytic	470	25V	CEA 471P 25
C9	Electrolytic	470	25V	CEA 471P 25
C10	Ceramic	0.01	150V	ACG-004

OTHERS

Symbol	Description	Part No.
	Microtemp	AEX-005
	Fuse clip	AKR-010


1
2
3
A
B
C
D
C7 470/100
C6 470/100
D1 ~ D4 SIB01-01 ×4
C1 ~ C4 0.01/250 ×4
C3
D3
C2
D2
C1
D1
C4
D4
R2 2.2K/2W
C8 470/25
C4 0.01/150
D5 SIB01-01
C5 0.01/150
D6 SIB01-01
FU4 1A
FU3 1A
FU2 1A
FU1 1A
15A 109°C
R1 3.3 (20W)
FU5 1.6A
R4 10/2W
C9 470/25
R3 10/2W
13
12
11
10
9
8
7
6
5
4
3
2
1
AWR-106, No.7
AWR-106, No.6
AWR-106, No.15
OR GRY
S3
S2
S1
GRN
RED
AC INLET
BRN
GRN
C12 0.01
220V
240V
50/60Hz
OR
BLU
BLU
T3
WHT
S1
AWX-096, No.1
AWM-091, No.2